

**CERTIFIED  
TRANSCRIPT**

NATIONAL FEDERAL MILK MARKETING ORDER  
PRICING FORMULA HEARING

DOCKET NO.: 23-J-0067; AMS-DA-23-0031

Before the Honorable Jill Clifton, Judge

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Carmel, Indiana

October 4, 2023

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Reported by:

MYRA A. PISH, RPR, C.S.R.  
Certificate No. 11613

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A P P E A R A N C E S:  
FOR THE USDA ORDER FORMULATION AND ENFORCEMENT DIVISION,  
USDA-AMS DAIRY PROGRAM:

Erin Taylor  
Todd Wilson  
Brian Hill  
Michelle McMurtray

FOR THE AMERICAN FARM BUREAU FEDERATION:

Roger Cryan

FOR THE MILK INNOVATION GROUP:

Ashley Vulin (Remotely)  
Charles "Chip" English  
Grace Bulger

FOR THE NATIONAL MILK PRODUCERS FEDERATION:

Nicole Hancock  
Brad Prowant

FOR SELECT MILK PRODUCERS, INC.:

Ryan Miltner

FOR EDGE DAIRY COOPERATIVES:

Dr. Marin Bozic

FOR INTERNATIONAL DAIRY FOODS ASSOCIATION:

Steve Rosenbaum

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(Please note: Appearances for all parties are subject to  
change daily, and may not be reported or listed on  
subsequent days' transcripts.)

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M A S T E R I N D E X

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1 WEDNESDAY, OCTOBER 4, 2023 - - MORNING SESSION

2 THE COURT: Let's go back on record.

3 We're back on record. It's 8:03 in the morning on  
4 October 4, 2023. It's a Wednesday.

5 Dr. Bozic, would you identify yourself, please?

6 DR. BOZIC: Dr. Marin Bozic for Edge Dairy Farmer  
7 Cooperative.

8 THE COURT: And you remain sworn.

9 MARIN BOZIC,

10 Having been previously sworn, was examined  
11 and testified as follows:

12 THE COURT: And we have been anticipating that you  
13 would clear up some questions that we had left over. How  
14 would you like to proceed? I have got two new exhibit  
15 numbers to give you. I have got, for example, 297, which  
16 could be for your Edge-15 corrected, and 298 for your  
17 Edge-15B corrected, if that's what you want.

18 THE WITNESS: Yes. Thank you, Your Honor.

19 THE COURT: Very good.

20 You may proceed.

21 (Exhibit Numbers 297 and 298 were marked for  
22 identification.)

23 THE WITNESS: This should take only four minutes.

24 If we can have the slides on the screen.

25 Mr. Wilson asked me yesterday morning how come  
26 that my baseline PPD was much higher than was published in  
27 the Journal of Dairy Science. Upon the urging of Your  
28 Honor, I did some forensics, and turns out that because I



1 wanted to use the version of the file that hasn't been  
2 modified or further automated since the Journal of Dairy  
3 Science article was published, I had on this slide a mix  
4 of two different orders.

5 So the first four columns, the baseline PPD,  
6 trends, III/IV spreads and advanced price -- the first  
7 five columns -- advanced prices and Class I reform, all of  
8 that was for Southwest Order, and then the depooling and  
9 actual PPD were for the Mideast order.

10 THE COURT: No wonder you couldn't figure it out.

11 THE WITNESS: So to err on the side of  
12 transparency, I've now included -- I have obviously  
13 modified all of these slides to properly be titled  
14 Southwest, and the last two columns corrected. But I also  
15 included additional slides for Mideast, as while I was  
16 testifying on Monday I read off some pooling numbers that  
17 were for Mideast. So just to, you know, err on the side  
18 of transparency, I included everything.

19 No conclusions are changed, no numbers presented,  
20 relative size of these numbers or the absolute values of  
21 those numbers, none of that changes. That's all from the  
22 file that has been previously part of a package that was  
23 reviewed for the Journal of Dairy Science. It was just  
24 wrong. The order of the -- the title of the order was  
25 wrong, so I now have both Southwest and Mideast.

26 In the Exhibit 15 I only included Southwest. And  
27 in the Exhibit 29- --

28 THE COURT: 298?



1 THE WITNESS: This is 298?

2 THE COURT: Oh, okay. So, I'm sorry. In 297, we  
3 have Exhibit 15 corrected --

4 THE WITNESS: Yes.

5 THE COURT: -- and in 298, 15B corrected.

6 THE WITNESS: Thank you, Your Honor.

7 In the Exhibit 297 I have modified only slides --  
8 only the titles and appropriate sentences to -- to clarify  
9 that it's the Southwest, not Mideast.

10 In the Exhibit 298, I have both Southwest and  
11 Mideast.

12 Those are the full extent of my corrections.

13 THE COURT: Now, for our viewing audience, who  
14 haven't seen anything up on the screen, that will come.

15 THE WITNESS: Yes, these exhibits will be posted  
16 on the Federal Order website sometime today, I assume.

17 THE COURT: Very good.

18 And in the meantime, I still would like to  
19 entertain moving them into evidence, even though, we  
20 know -- we know what to expect. We just haven't seen all  
21 of it yet.

22 What did you do in an attempt to alert the people  
23 who are in the room?

24 THE WITNESS: This morning, between 6:30 and  
25 7 o'clock, I sent these files to the -- to the AMS team as  
26 well as the counsels for all other parties.

27 THE COURT: What questions would anybody like to  
28 ask Dr. Bozic about this topic?





1           There are none.

2           Is there any objection to the admission into  
3 evidence of Exhibit 297, which is the corrected Edge-15,  
4 and includes the corrections to the -- did you say titles?

5           THE WITNESS: To the titles and some text in  
6 the -- on the -- related to the waterfall charts, related  
7 to the depooling analysis.

8           THE COURT: Is there any objection to that  
9 document being admitted? That's Exhibit 297.

10          There is none. Exhibit 297 is admitted into  
11 evidence.

12          (Exhibit Number 297 was received into  
13 evidence.)

14          THE COURT: With regard to Exhibit 298, which is  
15 the Edge-15B corrected, including both Southwest and  
16 Mideast orders, is there any objection?

17          There is none. Exhibit 298 is admitted into  
18 evidence.

19          (Exhibit Number 298 was received into  
20 evidence.)

21          THE WITNESS: Your Honor, this is -- I anticipate  
22 this is my last time on the stand, so I just want to  
23 express my gratitude for the hard work of your colleague  
24 that was here the first few weeks, yourself, AMS team, as  
25 well as all of the parties, and all I can say is we should  
26 do this more often. Thank you.

27          THE COURT: That's great.

28          You know, every participant in this hearing is so



1 valued. The Secretary cannot possibly address these  
2 issues without hearing from different parts of the  
3 country, different aspects of the business, and everyone  
4 is valued. And I appreciate your collegiality, and I have  
5 enjoyed, Dr. Boze (sic), welcoming all different people's  
6 explanations, and trying to puzzle through it, and trying  
7 to help the Secretary find something that would work. And  
8 I appreciate very much his good humor.

9 THE WITNESS: Thank you very much.

10 THE COURT: You're welcome.

11 Now, Dr. Vitaliano.

12 And I'm going to take just a minute to talk about  
13 the FEMA Emergency System trial that will happen at  
14 2:20 Eastern today throughout the entire country, an  
15 alert, to see if it works as an emergency alert. So help  
16 me remember that we should all go off record about 2:15,  
17 so wherever our devices are showing the alert, I think it  
18 will be on television as well as devices. So we'll see  
19 how that works. But help me be off record by 2:15, if you  
20 will.

21 Would you state and spell your name, please?

22 THE WITNESS: Peter Vitaliano, P-E-T-E-R, V as in  
23 Victor, I-T-A-L-I-A-N-O. It's the word "Italian" with a V  
24 on the front and an O on the back.

25 THE COURT: Have you previously testified in this  
26 proceeding?

27 THE WITNESS: I have, Your Honor.

28 THE COURT: You remain sworn.



1 THE WITNESS: Thank you.

2 PETER VITALIANO,

3 Having been previously sworn, was examined  
4 and testified as follows:

5 MS. HANCOCK: Good morning, Dr. Vitaliano.

6 Just for the record, Your Honor, not only has he  
7 been previously sworn in and testified, but he's also been  
8 previously designated as an expert in this matter.

9 THE COURT: Excellent.

10 DIRECT EXAMINATION

11 BY MS. HANCOCK:

12 Q. Dr. Vitaliano, did you prepare Exhibit NMPF-35 in  
13 support of National Milk's proposals related to Class I  
14 differentials?

15 A. I have.

16 MS. HANCOCK: And, Your Honor, I believe we're at  
17 Exhibit 299?

18 THE COURT: Yes.

19 MS. HANCOCK: If we could mark that exhibit. I  
20 missed the 300 by one exhibit.

21 (Exhibit Number 299 was marked for  
22 identification.)

23 THE COURT: Well, you want to step down for a  
24 minute?

25 THE WITNESS: In the interest of moving the  
26 hearing along, I will forego that privilege. Thank you.

27 BY MS. HANCOCK:

28 Q. Okay. Dr. Vitaliano, would you proceed with your



1 written testimony, please?

2 A. Yes.

3 This is a -- I have testified on all five of  
4 National Milk's proposals. My written testimony has  
5 followed the same form in all five. A -- start -- begins  
6 with an introductory section of a few pages describing our  
7 process of arriving at our package of proposals, and has a  
8 section later on on economic impact.

9 My original testimony on Proposal 1 on the very  
10 first day of this hearing -- seems like ages ago -- I read  
11 the full testimony into the record. Those repetitive  
12 parts I have not read subsequently, and I will follow  
13 basically that same procedure.

14 But since this testimony on Proposal 19 bookends  
15 that original one and the whole series, I will re-read a  
16 few selected paragraphs from those common sections to kind  
17 of refresh your memory and for the benefit of Your Honor.

18 I will note that the version -- the short version  
19 of my written testimony that we're handing out is just the  
20 textual part. The full version on the website is about  
21 80-some pages and contains the full list of the 3100-some  
22 counties, city, and parish differentials that we are  
23 proposing.

24 Q. And, Dr. Vitaliano, I forgot to mention. We  
25 originally submitted this in September at some point, I  
26 can't remember what the deadline was, and you have since  
27 amended just the counties, which is that last part of your  
28 testimony that begins on page 12; is that correct?



1 A. That's correct.

2 Q. And what did you change in the counties that was  
3 resubmitted? Do you recall?

4 A. From our technical group that put these together,  
5 I received only two, believe it or not, two corrections,  
6 to two counties in Texas. And the version that's posted  
7 on the website as Exhibit NMPF-35 has the corrected  
8 versions. I'm not sure whether the Appendix A version has  
9 them yet.

10 The two corrections are, for those of you who have  
11 those, Comanche County in Texas should be \$3.85.

12 THE COURT: Do you know what page?

13 THE WITNESS: I don't have that. If you give me  
14 the page number for the -- I don't have the full version  
15 in front of me.

16 MS. HANCOCK: Your Honor, your version should be  
17 corrected. I think he's just noting the difference that  
18 happened. But it should be on page 69.

19 THE COURT: Very good. Thank you.

20 And say it again, please, Dr. Vitaliano?

21 THE WITNESS: Comanche County, Texas should be  
22 \$3.85.

23 And then a few pages later, Travis County,  
24 Texas -- there are a lot of counties in Texas, it takes up  
25 several pages -- it should be \$4.35 --

26 MS. HANCOCK: And that's on page 73.

27 THE WITNESS: -- instead of 4.70 -- \$4.70.

28 With that, let me begin my statement.



1 I'm Peter Vitaliano, Vice President of Economic  
2 Policy and Market Research for the National Milk Producers  
3 Federation.

4 Skipping to the last paragraph on page 2, those of  
5 you following.

6 NMPF has engaged in an almost two-year  
7 comprehensive study of needed updates to the Federal Order  
8 pricing formula provisions. NMPF has undertaken this  
9 important activity with the essential and dedicated  
10 assistance of dozen of marketing experts from the staffs  
11 of its member cooperative marketing associations.

12 In a series of well over 200-monthly virtual  
13 meetings by this mostly virtual meetings, this team  
14 examined every detail of the current federal pricing  
15 formulas of the Federal Order uniform pricing regulations  
16 in 7 CFR, paragraph 1000.50 through 52.

17 The goal was developed -- to develop a  
18 comprehensive, integrated, and balanced program of updates  
19 to these formulas, to realign them more fully with the  
20 structural realities of the current dairy industry, and to  
21 address the disorderly marketing conditions which the  
22 growing misalignment has allowed to develop. This effort  
23 included considerations of mechanisms for making further  
24 updates in the future as the industry continues to evolve.

25 The comprehensive package which resulted includes  
26 seeking additional legislative authority for USDA to  
27 conduct mandatory studies of manufacturing costs and  
28 product yield factors, seeking a change via ordinary rule



1 making for the regulation implementing the dairy product  
2 mandatory reporting program, and five recommendations for  
3 amendments to the uniform pricing provisions for all  
4 Federal Orders.

5 The NMPF Board of Directors unanimously approved  
6 this package of recommendations, including the five  
7 recommendations for proposed amendments to all Federal  
8 Orders which NMPF has submitted as Proposals 1, 3, 7, 13,  
9 and 19.

10 This testimony today is in support of Proposal 19  
11 concerning the Class I and Class II differentials. NMPF  
12 requests that the Secretary amend 7 CFR 1000.50(b) and (c)  
13 and 1052 applicable --

14 THE COURT: Sorry, that's .52.

15 THE WITNESS: .52.

16 THE COURT: And please go very slowly through  
17 this. This is very hard to capture just by hearing it.

18 THE WITNESS: Okay.

19 -- applicable to all Federal Milk Marketing  
20 Orders, as well as 7 CFR, paragraph 1005.51(b), paragraph  
21 1006.51(b), and paragraph 1007.51(b), as specified at the  
22 conclusion of this testimony, which would increase the  
23 Class I differentials for all counties, parishes, and  
24 cities of the 48 contiguous United States to reflect the  
25 current cost of providing adequate supplies of fresh milk  
26 to fluid processing plants.

27 The majority of Federal Order Class I  
28 differentials have remained unchanged since Federal Order



1 Reform, as reviewed and revised by Congress. The  
2 differentials in the Appalachian, Florida, and Southeast  
3 orders were modestly updated in 2008.

4 Just as the Make Allowances embedded in the milk  
5 component pricing formulas are out of date, so, too, are  
6 the underlying cost assumptions embedded in the Class I  
7 differentials. Since the current Federal Order Class I  
8 differentials were established, one of their key  
9 determinants, fuel costs and the basic per mile cost of  
10 hauling milk, have increased significantly. Truck driver  
11 per-day hours have been reduced, which has required more  
12 truck drivers and investment in more rolling stock.  
13 Additionally, federal requirements for in-truck electronic  
14 driver and truck logs were implemented during this period.  
15 Higher capital investments have also driven up overall  
16 milk hauling costs.

17 Other structural changes have increased both the  
18 costs and general availability of milk hauling, including  
19 increased road tolls, restrictive and variable road weight  
20 limits, labor shortages, and truck, trailer, tire, and  
21 replacement parts and shortages, as well as significant  
22 diesel fuel cost increases.

23 THE COURT: I'm sorry, go back again to the "and  
24 replacement parts," and finish from there, please.

25 THE WITNESS: And replacement parts and  
26 shortages --

27 THE COURT: So --

28 THE WITNESS: -- of replacement parts.





1 THE COURT: So replacement parts costs?

2 THE WITNESS: Costs and shortages thereof.

3 THE COURT: Thank you. You may continue.

4 THE WITNESS: Thank you.

5 Driven by the increase --

6 THE COURT: I'm sorry, I didn't mean for you to  
7 abandon the rest of your sentence.

8 THE WITNESS: Oh, okay.

9 -- as well as significant diesel fuel cost  
10 increases.

11 Driven by the increased cost of hauling milk per  
12 loaded mile, the cost per hundredweight for 100 miles has  
13 almost tripled since the current Class I differentials  
14 were established. Compounding this greater expense,  
15 opportunities for reducing costs through backhauls have  
16 become more limited.

17 For example, in the Florida Order, the marketing  
18 area most distant from a reserve milk supply, backhauls of  
19 orange juice and orange juice concentrate used to be  
20 common. However, today, reduction in the Florida citrus  
21 industry and the availability of juice concentrate from  
22 other countries have nearly eliminated juice backhauls out  
23 of Florida. Where backhauls may still be an option,  
24 processors often forbid the possibility by requiring  
25 tanker trailers to remain dedicated to delivering milk and  
26 dairy products only.

27 Changes in the relative locations of farms and  
28 fluid milk processing plants have also increased the cost



1 of delivering Class I milk to markets. Development in  
2 exurban fringes has displaced dairy farms. The location  
3 of milk production is increasingly distant from human  
4 population centers, while Class I processing plants remain  
5 in cities due to the higher per unit cost of transporting  
6 packaged fluid milk relative to bulk unprocessed milk.  
7 The miles that bulk raw milk must travel to get from dairy  
8 farms to processing plants have increased.

9 The combination of increased miles milk must move  
10 to serve Class I markets and the significant increases in  
11 the per mile cost of moving milk is threatening the  
12 reliability of milk supplies for Class I use in many  
13 Federal Orders. The Class I differentials which continue  
14 to be the fundamental regulatory mechanism of the Federal  
15 Order program for attracting an adequate supply of farm  
16 milk for fluid milk processing remain largely unchanged  
17 since Federal Order reform 23 years ago.

18 In addition to increases in milk hauling costs  
19 since 2000, all contributors to the costs of producing  
20 Grade A milk at the farm have also increased. Class I  
21 prices are the only Federal Order prices for which the  
22 cost to producers is taken into account, albeit in an  
23 indirect fashion.

24 The Federal Order base Class I differential has  
25 historically recognized that there has been a difference  
26 in the cost of producing milk solely for manufacturing use  
27 and the cost of producing for daily delivery to the  
28 Class I market. Over time, and with the Federal Order



1 reform changes in manufacturing class use prices  
2 eliminating any competitive milk procurement factor in a  
3 base milk price, the Class I differential base price now  
4 represents a modest nod to production costs at the  
5 producer level.

6           Since 2000, those costs have risen far more than  
7 the limited increase in the base Class I differential from  
8 \$1.60 per hundredweight to \$2.20 per hundredweight as  
9 embedded in the NMPF proposal, Proposal 19 that is. The  
10 base Class I differential also plays an important role in  
11 reducing instances of class price inversions, the  
12 importance of which the Department stressed in Federal  
13 Order reform, as previously reviewed in my testimony on  
14 Proposal 13 earlier in this hearing.

15           NMPF recognizes and supports USDA's longstanding  
16 policy of maintaining federally-regulated prices as  
17 minimum prices and allowing market forces to fine-tune  
18 market prices. However, structural changes in the  
19 industry are limiting the reach and effectiveness of  
20 over-order pricing for milk used in fluid milk products.

21           Larger fluid milk plants, higher costs of hauling,  
22 increased distances raw unprocessed milk must travel to  
23 supply Class I processing needs, and growing resistance by  
24 handlers to accept over-order prices are leaving many  
25 costs of serving Class I processors increasingly  
26 uncovered. The result is disorderly marketing conditions.  
27 As costs increase and the capacity for over-order prices  
28 to keep up with these costs wane, pricing equity between



1 competing processing plants is threatened. Worse, dairy  
2 farmers are subsidizing shortfalls of Class I prices to  
3 cover the full cost of supplying Class I milk to  
4 processors.

5 Taken together, milk transportation costs,  
6 producer production costs, and other factors have created  
7 a market environment in which the Federal Orders operate  
8 which is antithetical to the goals of the Federal Order  
9 system. That is, ensuring adequate supplies of milk for  
10 fluid processing, equitable treatment of producers and  
11 processors, and providing for the orderly marketing of  
12 milk. It is important for USDA to ameliorate this, as  
13 well as other changes that are eroding the effectiveness  
14 of the Federal Order system.

15 Our proposed solution to update the current  
16 Class I differentials for all counties, parishes, and  
17 cities in the contiguous United States.

18 NMPF's proposal to address these multiple  
19 challenges and to help alleviate the economic stresses on  
20 milk marketers who have accepted the responsibility of  
21 supplying the marketplace with milk for Class I use is to  
22 update the adjusted Class I differentials for every U.S.  
23 county, parish, and city currently listed 7 CFR, paragraph  
24 1000.52.

25 The method NMPF has followed to develop its  
26 proposed update to the Class I differentials follows the  
27 general process previously used during Federal Order  
28 reform. This method also follows certain precepts of



1 price alignment accepted by the Secretary in the  
2 Southeastern Order pricing hearing held in 2007.

3 In brief, NMPF commissioned an update to the  
4 University of Wisconsin, previously Cornell University,  
5 national price surface model using 2021 model input data,  
6 including milk supplies, dairy product demand, cost of  
7 processing milk, and the cost of transporting milk and  
8 dairy products. The model has been greatly expanded to  
9 include many more supply and demand points, as well as  
10 considerably more point-to-point road mileages.

11 NMPF used the model outputs from the University of  
12 Wisconsin model as a starting point. NMPF then applied  
13 local knowledge of milk movement, plant locations, and  
14 historic price relationships to refine the model results  
15 and prepare a rational regulated Class I value surface,  
16 using time-honored Class I price alignment techniques and  
17 processes. NMPF's final Class I recommendations deviated  
18 somewhat from the model results due to a variety of  
19 real-world milk movement considerations, as will be  
20 addressed in further hearing testimony.

21 In all locations, as would be expected given the  
22 substantial increases in the cost of milk hauling, the  
23 recommended regulated Class I differential surface  
24 increased versus the current regulated Class I  
25 differentials. The tilt, or slope, of the price surface  
26 from reserve supply points to Class I demand points has  
27 become steeper, and the geographic locations representing  
28 the reserve supply of milk have generally shifted toward



1 western states. Similar to the general nature of the  
2 existing Class I differential price surface, the updated  
3 price surface slopes from lower values in the Northwest  
4 and West areas of reserve supply, with increasing values  
5 when moving toward the milk deficit areas of the  
6 Southeast.

7 The updated Class I differentials, as proposed,  
8 which resulted from this NMPF analysis, reflect less than  
9 the full cost of moving milk, and thereby maintain the  
10 Department's longstanding principle of minimum prices. In  
11 developing this proposal, NMPF used the expertise of  
12 numerous individuals responsible for marketing milk in  
13 NMPF member cooperatives, as well as others that have  
14 longstanding expertise in the national Class I price  
15 surface. Their expertise was used to further refine the  
16 model results to develop the proposed pricing surface that  
17 best fits the reality of today's marketplace. As such,  
18 the proposal does not follow the model's results in every  
19 instance, as there are both positive and negative  
20 deviations from the model results to better support a more  
21 orderly marketing system.

22 The results of the NMPF study, analysis, and price  
23 alignment processes are included in Figure 1 below. It is  
24 a color-coded representation map, as shown, that visibly  
25 presents the 3,108 counties, parishes, and independent  
26 cities and each civil district's Class I differentials.

27 Exhibit USDA-46, which is Hearing Exhibit  
28 Number 46, provides a summary of the Proposal 19 national



1 average Class I differentials by Federal Order.

2 This testimony provides an overview of NMPF's  
3 justification for adoption of Proposal 19. More detailed  
4 testimony will follow that supports all or key portions of  
5 Proposal 19, including testimony provided by Jeff Sims,  
6 representing NMPF member cooperative Lone Star Milk  
7 Producers, as well as an expert witness from the  
8 University of Wisconsin who will testify about the  
9 national price surface model used to develop Proposal 19,  
10 also, other members of the NMPF task force that developed  
11 NMPF's Federal Order modernization proposals, and  
12 producers who are members of NMPF member dairy  
13 cooperatives.

14 I will read a few more paragraphs from the  
15 following section on the economic market impacts of NMPF's  
16 proposed changes, starting in the top of page 8:

17 Figure 2 provides a perspective on the key issue  
18 of the impact of NMPF's proposals on consumers of the  
19 Federal Order program and potential changes to the  
20 regulatory provisions of that program. This figure charts  
21 the monthly consumer price indices (CPIs) reported by the  
22 U.S. Bureau of Labor Statistics (BLS) over the past decade  
23 and a half for all items -- which is the line in red --  
24 which is the general measure of overall consumer price  
25 inflation, also referred to as the overall cost of living,  
26 together with the aggregate CPIs for all food and  
27 beverages shown in green, for all dairy products shown in  
28 the bright blue, and for all fluid milk products shown in



1 a sort of darker shade of blue, the principal -- which is  
2 the principal regulatory focus of the Federal Order  
3 program, that is, fluid milk.

4 These CPIs reflect actual retail prices paid in  
5 all U.S. cities, but they are expressed in the form of  
6 indices with their respective U.S. average retail prices  
7 during the 36-month period of 1982 through '84, each set  
8 to the value zero to facilitate comparisons.

9 THE COURT: Now, mine doesn't say "zero," so you  
10 will need to explain to me.

11 THE WITNESS: Oh, set to the value 100, to  
12 facilitate --

13 THE COURT: So, it's not me.

14 THE WITNESS: Excuse me?

15 THE COURT: I'm just making a joke.

16 THE WITNESS: Oh.

17 THE COURT: So I don't quite understand that, but  
18 I'm sure I will before we finish.

19 THE WITNESS: Yeah. The use of indexing is a  
20 standard method when you want to compare something like,  
21 you know, the cost -- the cost of a product A might have  
22 been \$2 each in a base period, and the cost of another  
23 product B that you want to make a comparison to may have  
24 been \$3, and so if -- if both of them have increased at,  
25 let's say the same rate, in ten years from that base  
26 period, they will still be different.

27 If you want to show how the price of both products  
28 changed relative to each other, you would take that base





1 period, you would divide the \$2 product price by \$2 and  
2 get it down to say, you know, basically 100. If you  
3 divide \$2 by \$2, you don't get a dollar figure, you just  
4 get an index number. That would be 100, or basically, you  
5 know, 100% starting out. You would divide the \$3 product  
6 price, product B, by \$3, and put its higher price down to  
7 an index value of 100. So the two of them would start out  
8 at the same relative price.

9 So over time, let's say ten years out, if  
10 product A price stayed fixed, and product B's went up by  
11 10%, at the end of that ten years, the index of product A  
12 would still be 100, the index of product B would be 110,  
13 so you could see instantly that product B inflated more  
14 than product A. Whereas, if you looked at a chart of \$2  
15 and \$3 starting out, and \$2 and, you know, 3 -- you know,  
16 3.30, in ten years, it wouldn't be quite as obvious how  
17 they changed relative to each other. So it's just a way  
18 of putting them on a common denominator so you can  
19 compare.

20 And so index -- or Figure 2 then shows the  
21 relative rate in which general inflation in red, all food  
22 and beverage inflation, which is an aggregate number,  
23 everything put together, that's the way CPIs are done,  
24 where some of them are very broad and some of them get  
25 more and more specific. You can get down to -- you know,  
26 the price of butter has its own CPI. And then you can  
27 compare how a somewhat more disaggregated category, like  
28 dairy, which is embedded in that all food and beverages,



1 you can see how dairy in the brighter blue line has  
2 inflated relative to all food and beverages, and you can  
3 see how dairy, over time, has gotten less and less  
4 expensive relative to all food and beverages.

5 They started out the same at 100 during that base  
6 period in the early 1980s, but as I'll show in my  
7 continued text here, going back to 2008, although that's,  
8 what, 25 years after the base period, they still -- all  
9 four of these indices were pretty close to each other.  
10 That means in 2008, the overall cost of living was -- had  
11 gone up about the same as all food and beverages, which  
12 was about the same as all dairy, which was about the same  
13 as fluid. They were all about the same. You could  
14 have -- you could have updated them to an index of 2008,  
15 and this chart would look very similar. That's just  
16 indexing chart mathematics -- arithmetic is what it is  
17 really.

18 THE COURT: Whoa, thank you. I would never have  
19 been able to figure it out without your explanation, and I  
20 appreciate that.

21 THE WITNESS: I'm happy to give it an explanation,  
22 because it's a pretty simple concept once you look at it.

23 So what this chart shows us is over these  
24 15 years, how much have consumers needed to pay -- how  
25 much more have consumers needed to pay for the overall  
26 cost of living, everything they spend money on? How much  
27 more they have had to pay for food and beverages, how much  
28 they have had to pay for all dairy as an aggregate



1 category, how much more they have had to pay for fluid  
2 milk.

3 So continuing to -- Figure 2 shows that the retail  
4 prices represented by all four of the measures pictured  
5 had increased as of 2008 by about the same amount,  
6 slightly more than doubling during the quarter century  
7 since the index base period.

8 And that is because the index period they were all  
9 at 100 in the early '80s, in 2008 they were about 210,  
10 meaning they had, both slightly -- all of them had  
11 slightly more than doubled. That's what going from 100  
12 index value to 210 means. They had all kind of gone up  
13 the same.

14 From 2008, the overall cost of living and the cost  
15 of all food and beverages have both continued to increase  
16 at a relatively steady pace, which accelerated during the  
17 recent bout of inflation, mostly last year and the year  
18 before, 2021/2022, at a relative -- with food and beverage  
19 prices slightly outpacing the overall inflation rate  
20 particularly in recent months.

21 And that's where those -- toward the right-hand  
22 side where everything started going up faster, that was  
23 the inflationary period that we have all read about in the  
24 last couple of years.

25 The less aggregated dairy and fluid milk CPIs have  
26 shown a greater sensitivity to the price of producer milk,  
27 including the 2009 price plunge, the price spikes of 2014  
28 and 2022, and the stagnation of prices between these two



1 peaks. This closer connection between farm and retail  
2 prices for dairy stems from the fact that the cost of raw  
3 milk has averaged about 31% of the retail value of dairy  
4 products since 2002, while the farm value of most food and  
5 beverage products represents a much smaller share of the  
6 total retail value of the finished products, which  
7 accordingly, reflect more closely the main drivers of  
8 overall retail price inflation, including such factors as  
9 energy, labor, and transportation.

10 That means when you have such broad categories,  
11 all food and beverages, it's a very specific part of the  
12 economy, but it's so broad that the rate of inflation  
13 that's affected food is not all that different, slightly  
14 faster, than affecting everything in the economy, which is  
15 a much broader measure. Because it's -- food and beverage  
16 is such a big category by itself, whereas dairy is more  
17 specific and a little different because the value of the  
18 raw product, milk itself, raw milk, is a much bigger  
19 portion of the retail price than, say, how much a box of  
20 corn flakes -- how much the price of raw corn affects a  
21 price of a box of corn flakes, which is much smaller.

22 However, those factors have also caused retail  
23 prices, price inflation for dairy products, to outpace  
24 general and food/beverage price inflation during the  
25 recent bout of general price inflation. That's 2022  
26 particularly. But also, it's caused dairy prices to  
27 recover more quickly from that bout of inflation with  
28 dairy product retail prices actually dropping this year,



1 while the two more general CPIs, overall inflation and  
2 food and beverages, continue to increase.

3 And you can see from this figure that food and  
4 beverage inflation has -- has actually recently outpaced  
5 overall inflation slightly, that's the green line,  
6 diverging above -- increasingly above the red line,  
7 overall inflation.

8 But you will note that the dairy line has  
9 actually -- it went up faster during the -- than the  
10 another two broader categories, during this recent  
11 inflationary period, but it's now dropping. And fluid  
12 milk has stayed generally below the overall dairy rate of  
13 inflation during most of this period. It experienced a  
14 bout of increased inflation along with all these other  
15 categories, but is now dropping down again below the  
16 overall dairy line.

17 Of particular significance to the -- for the  
18 current purpose, the overall cost -- and this -- general  
19 purpose, we have had a lot of discussion about the impact  
20 of prices to consumers and its effect on fluid milk  
21 consumption. The overall cost to consumers of dairy  
22 products, and fluid milk products in particular, has  
23 declined during the illustrated period relative to both  
24 overall inflation, as well as general food and beverage  
25 price inflation.

26 One noteworthy datum is that the simple difference  
27 by which the monthly CPI for all fluid milk has fallen  
28 below the monthly CPI for all food and beverages reached



1 its highest level ever in July 2023. That's the  
2 difference over on the far right-hand side between the  
3 green line where it -- where it ends against that right  
4 margin, and the duller blue line representing fluid, which  
5 is the lowest of these. You can see how that fluid milk  
6 has diverged more and more below the overall cost of food  
7 and beverages.

8 Agricultural production enjoys built-in  
9 productivity advantages due to its biological basis, which  
10 can generate increases in production per animal, or  
11 increases in production per planted unit as a result of  
12 genetic improvements and other productivity, which are  
13 enhancements unique to biological production processes.  
14 These advances generate unit cost reductions which the  
15 competitive nature of farming passes on up the various  
16 agricultural and food marketing channels, eventually to  
17 consumers. This consumer cost reduction aspect of  
18 agriculture varies in direct relation to the proportion  
19 which the basic agricultural commodity represents of the  
20 total retail value of the resulting food products, which,  
21 as mentioned, is relatively high for dairy products.

22 This aspect of agricultural production, coupled  
23 with the great productivity of U.S. agriculture, has  
24 resulted in the general cost of food representing one of  
25 the smallest proportions of total consumer income in the  
26 United States compared to that in all other countries.

27 It is, therefore, very difficult to consider the  
28 facts presented in Figure 2 which reflect the relative



1 influence of all economic factors at play in producing  
2 general, food and beverage, overall dairy product, and  
3 fluid milk product price inflation over the past decade  
4 and a half, which is a period that includes the continuous  
5 operation of the Federal Order program -- to go back and  
6 repeat the beginning -- it is, therefore, difficult to  
7 consider these facts and conclude that Federal Orders have  
8 had a deleterious effect on consumer welfare via the  
9 retail price of dairy products and retail prices of fluid  
10 milk and retail prices of dairy products in general.

11 Skipping then to last section on the bottom of  
12 page 10.

13 NMPF sincerely wishes to thank Secretary Vilsack  
14 and the Department for holding this important hearing, and  
15 for thoughtfully considering adoption of its proposed  
16 amendments to the Federal Milk Marketing Order  
17 regulations. NMPF has devoted considerable time and  
18 resources to thoughtfully considering and recommending the  
19 important changes it considers necessary to correct the  
20 growing misalignment between the dynamic changes in the  
21 U.S. dairy industry since Federal Order reform and the  
22 largely unchanged factors in the critical Federal Order  
23 component and Class IV class price formulas originally  
24 adopted at that time, the time of Federal Order reform.

25 Together, NMPF is requesting the Secretary to  
26 amend certain provisions of 7 CFR 1000.50.52 -- excuse  
27 me -- dash, 52, those three sections, 1000.50, 1000.51,  
28 and 1000.52, which are applicable to all Federal Milk



1 Marketing Orders, and 7 CFR 1005.51(b), paragraph  
2 1006.51(b), and paragraph 1007.51(b). The changes in  
3 these regulations that Proposal 19 would entail are as  
4 follows, which includes, as we have always portrayed  
5 them -- the proposed regulatory changes we are portraying  
6 in our testimony at this hearing, include all of the five  
7 proposals' language. We have not singled out a single one  
8 of them.

9 And the changes that Proposal 19 would bring are  
10 relatively simple on this -- this page.

11 Section (b) of 1000.50, class prices, component  
12 prices and advanced pricing factors, (b), Class I skim  
13 milk price: The Class I skim milk price per hundredweight  
14 shall be the adjusted Class I differential specified in  
15 paragraph 1000.52 -- strike "plus the adjustment Class I  
16 prices" in those three sections indicated, which our  
17 Proposal 19 would propose that those separate -- separate  
18 amended -- or increased Class I differentials in the three  
19 Southeastern Orders be reincorporated back into 1000.52.  
20 Since our proposal redoes the entire differential surface,  
21 there's no need to keep those separated. And to simplify,  
22 those would be struck, plus "the simple" -- the higher of  
23 the advanced pricing factors, etcetera. That's our  
24 language -- proposed language for Proposal 13.

25 (c), the Class I butterfat price: Similarly, the  
26 Class I butterfat price per pound shall be the Class --  
27 adjusted Class I differential specified in 1000.52 divided  
28 by 100, strike the language that adds those three





1 Southeastern Order butterfat differential sections.  
2 They'd be reincorporated into section --  
3 paragraph 1000.52, along with the skim milk price factors.

4 And then we would delete -- propose to delete in  
5 their entirety, Sections paragraph 1005.51(b),  
6 paragraph 1006.51(b), and paragraph 1007.51(b). Those are  
7 the sections in the three Southeastern orders that specify  
8 those -- those adjustments to the base Class I  
9 differentials that would now -- we would roll into  
10 1000.52.

11 And then the adjusted Class I differentials,  
12 adjusted for location to be used in 1000.50(b) and (c)  
13 shall be as follows: We would delete everything that  
14 follows in that -- in section -- in the language of  
15 paragraph 1000.52 and substitute the list that is on  
16 page -- starting page 12 through page 82 of Exhibit 299,  
17 which includes the recommended price surface -- Class I  
18 differential price surface that National Milk is proposing  
19 in Proposal 19.

20 So that concludes my read/spoken testimony.

21 MS. HANCOCK: Your Honor, at this time we would  
22 make Dr. Vitaliano available for cross-examination.

23 THE COURT: Thank you.

24 MR. ENGLISH: Good morning, Your Honor.

25 CROSS-EXAMINATION

26 BY MR. ENGLISH:

27 Q. My name is Chip English for the Milk Innovation  
28 Group.



1 Good morning, Dr. Vitaliano.

2 A. Good morning, Mr. English.

3 Q. So let me start off, and I might end here as well,  
4 is this the last time you will be presenting for National  
5 Milk at this hearing as far as you know?

6 A. As far as I know, this is the last time I will be  
7 presenting testimony. With this hearing, I have stopped  
8 making predictions.

9 Q. And so I thank you for that.

10 So let me begin at the bottom of page 2 of your  
11 statement, and that is the discussion about a two-year  
12 long comprehensive study.

13 When precisely did National Milk Producers  
14 Federation begin the comprehensive study?

15 A. I began probably in the summer of 2021, or two  
16 years ago, by looking at all of the current Federal Order  
17 product price formulas as shown in the USDA AMS fact  
18 sheets that were handed out here, the Class I, Class II,  
19 Class III, Class IV. Looked at each of those pieces in  
20 every -- every part of those proposals, and looked at, you  
21 know, what -- what might need to be updated.

22 And then there was discussion with it. It  
23 probably started rolling into a higher gear in late 2021,  
24 when we formally put together a task force of our member  
25 specialists. We hired a consultant, Mr. Jim Sleper, to  
26 manage that process.

27 So there was not a kickoff date where we said,  
28 we're now in the process. But by the end of 2021, we were



1 fully engaged in this process.

2 Q. Would it be fair to say that that was also in line  
3 with when the International Dairy Foods Association  
4 engaged about Make Allowances?

5 A. I don't know your exact timeline, but I know that  
6 was a -- that was an effort that the International Dairy  
7 Foods Association undertook.

8 Q. So when did Class I come into the equation, at the  
9 same time or after the Make Allowances conversation?

10 A. The Class I surface discussion was the last piece  
11 because it was going to be the lengthiest, and we needed  
12 the University of Wisconsin study results to begin that.  
13 And so that -- that part could not proceed in earnest  
14 until we had -- you know, turned out to be the third  
15 iteration of the model results to -- to work with.

16 Q. So -- so actually, there's a lot to unpack there,  
17 so I appreciate it very much, because you anticipated  
18 about the next eight or nine questions.

19 So when did National Milk Producers Federation  
20 retain the University of Wisconsin to perform the model  
21 study -- the first model study?

22 A. I can't give an exact time, but I would say it was  
23 basically in -- sometime in the springtime of 2022.

24 Q. Which would be consistent with the fact that the  
25 runs that Dr. Nicholson provided were for May of 2021 and  
26 October 2021, correct?

27 A. Yes. We wanted to include to -- to include a --  
28 you know, a recent period, but we wanted to avoid using



1 2022 numbers that were probably subject to this recent  
2 bout of inflation that I illustrated in Figure 2, on the  
3 assumption that that might be a little non-representative.  
4 We may end up being wrong there. But we intentionally did  
5 not take the most recent highest cost in that current bout  
6 of inflation. We intentionally limited it to 2021.

7 Q. So when did National Milk Producers Federation  
8 receive the first iteration of the model results?

9 A. Probably would have been sometime in the spring of  
10 2021, 2022.

11 Q. And what did the University of Wisconsin do for  
12 that study, that model run, if you know?

13 A. That first model run, the University of Wisconsin  
14 crew -- there's a long pedigree to that model. They have  
15 updated it and run it for various purposes several times,  
16 I think including several times since 2021. The model has  
17 grown in size and complexity as the computing power in a  
18 laptop has grown.

19 And so I think during -- during recent years, the  
20 keepers of that model have updated a lot of the components  
21 of it, even prior to us engaging them. But the one  
22 thing -- among others, the one thing that they really  
23 looked to our help for was to update the plant list,  
24 because our task force had a lot of knowledge of current  
25 plants, plants that were going to be closed, plants that  
26 were soon coming online.

27 And so the first model run, the University of  
28 Wisconsin folks, you know, running the model, had -- had



1 updated a lot of the parts of it. Then, you know -- well,  
2 go ahead. So that answers that question.

3 Q. Okay. So -- so you received the results of the  
4 first iteration.

5 And what, if anything, did you ask with respect  
6 to, say, maybe this plant information with respect to the  
7 second run -- now, I am focusing on the second iteration  
8 right now rather than the third. What, if anything, did  
9 you ask with respect to the second iteration?

10 A. We took a look at it, at the results, and even  
11 after the first run, we concluded that the model results  
12 even of that first run were a relatively good  
13 representation of what our specialists, with all of their  
14 local knowledge, understood might be a -- you know, a  
15 reasonable current Class I differential surface.

16 We -- we didn't -- other than providing some  
17 updated plant information, I don't recall we made any  
18 major changes. We will -- our -- our next witness is one  
19 of the -- is the current keeper of that model, and so he  
20 probably would be better -- you know, better informed in  
21 terms of what we fed back to them at that time. And so I  
22 would recommend you keep that question, make sure you ask  
23 him that question as well.

24 Q. I appreciate your attempt to deflect to him, but  
25 for the moment, if I may, I at least want to explore,  
26 since you are the witness for National Milk Producers  
27 Federation, and the other witnesses, 20 or so, are either  
28 Dr. Nicholson or individual NMPF members. I'm trying to



1 just focus and understand from everybody. So I get it if  
2 you don't have the precision, that's fine, I just want to  
3 understand what you recollect.

4 So when did you receive the results of the second  
5 iteration?

6 A. It would have been several months after that,  
7 after we received the first one. It took some time  
8 between -- between the iterations of the model.

9 Q. So early summer, mid-summer 2022?

10 A. Probably around that time, yes.

11 Q. And then after you received the second iteration,  
12 what did you ask of University of Wisconsin before it ran  
13 the third iteration?

14 A. We might have added a few more -- given a few more  
15 updated plant information, but I don't recall there was  
16 anything of great significance that we -- you know, we fed  
17 back. There was some -- you know, all of our individual  
18 task force members looked at the numbers in their  
19 particular regions because they were gearing up for the  
20 task of taking the final run and working through the  
21 process of up- -- of adding their institutional knowledge  
22 of -- of, you know, the realities of the industry in their  
23 regions to those results.

24 So they wanted to make sure that -- that the model  
25 results were -- were reasonably correct, because we did  
26 not -- we specifically did not want to end up making major  
27 changes to what the model showed. So we wanted to just  
28 make sure that the results in all of those areas looked



1 reasonable enough so that when we applied the -- the art  
2 part of the process, that we would stick as close as  
3 possible to what the model results showed.

4 Q. So a few minutes ago you mentioned, whether it was  
5 the second iteration or the third iteration -- and I'm  
6 going to take it apart -- at first you provided University  
7 of Wisconsin information with respect to closed  
8 facilities, correct?

9 A. Yes.

10 Q. So those were plants that were closed, not  
11 closing, correct?

12 A. There may have been a few that were -- we knew  
13 were going to be closing, and so we didn't, you know -- to  
14 the extent that we were sure that they were going to  
15 close, we -- we felt it was not going to be useful to have  
16 that in the model results. We wanted to have it as  
17 current as possible.

18 Q. And what about the plants that you understood to  
19 be being built, what -- what categories of plants would  
20 that include?

21 A. I remember there was, I think, a butter powder  
22 plant. But again, I would refer you to our task force  
23 members' testimony because they would know much more  
24 specifically what they fed into that process in their own  
25 regions.

26 Q. You mentioned the art. Other than the plants that  
27 were closed or closing, or the plants that were planned or  
28 you thought would open, and recognizing I should ask



1 others the details, did you, for the third iteration,  
2 provide the University of Wisconsin with any information  
3 about the art?

4 A. No, because we understood particularly by the  
5 third run, what the model could do, which was amazing, all  
6 the detail that it could do. But everybody who was  
7 involved in that art part had done this sort of thing  
8 before, and they knew the kinds of things that was just  
9 not likely to be incorporated in the model. Because we  
10 had a very good idea of what the model could and what the  
11 model couldn't do, and we were planning to, and preparing  
12 for, and did, apply that institutional knowledge that the  
13 model was not able to take into account. And there will  
14 be plenty of testimony about what those things are  
15 originally.

16 Q. I'm very well aware.

17 A. Yes.

18 Q. But -- but what kind of experience -- so let's  
19 backtrack for a minute.

20 The last time the Class I differentials were  
21 updated nationwide was during Federal Order reform,  
22 correct?

23 A. That's correct.

24 Q. And then the only other changes were from the  
25 Southeast hearing, which was decided at the end of  
26 February 2008, correct?

27 A. That's correct.

28 Q. So did these -- when you say that these people had





1 been involved, are you saying that outside the Southeast,  
2 these were people who had been involved in Federal Order  
3 reform in this art?

4 A. They were people who were aware of that process of  
5 the model results, and -- and what would -- what was  
6 generally needed to -- to work with the model results  
7 supplying that institutional knowledge of their local  
8 areas.

9 Q. And is it National Milk Producers Federation's  
10 view that the use of the art made modest changes to the  
11 model?

12 A. Yes, we think it has.

13 Q. So to the extent that we have seen on the USDA  
14 website the results of the model, you would agree with me  
15 that even after the third iteration, the model used the  
16 current base Class I differential of \$1.60, correct?

17 A. That's correct.

18 Q. When did the concept of increasing the base price  
19 from \$1.60 to \$2.20 arise?

20 A. Throughout the current, the entire process of  
21 working with the various runs of the University of  
22 Wisconsin model, the University of Wisconsin personnel,  
23 Dr. Nicholson, Dr. Mark Stephenson emphasized to us what  
24 we already kind of knew, that the model did not solve for  
25 the base -- the lowest differential, that it only solved  
26 for relative differences. That the model basically came  
27 out with -- and, again, the differences between the  
28 various locations. And that they continuously asked us



1 what should we set the base differential, the \$1.60, even  
2 though that did not affect -- they did not need that  
3 information for their actual analysis of the spatial  
4 differences.

5 Our group was preparing to do the hard work of  
6 looking at taking the geographic spatial relationships  
7 and -- and modifying them for things that the model could  
8 not do. We specifically put off the discussion of what  
9 the minimum differential should be until we completed that  
10 other process, and then turned our attention to what it  
11 should be. The \$1.60 was maintained through the model  
12 runs because it was what was in the current Federal Order  
13 provisions.

14 Subsequent discussions with working with the model  
15 results led us to conclude that since the \$1.60 was based  
16 on several cost factors, and those cost factors had gone  
17 up, just like the cost factors affecting the spatial  
18 differences had gone up, that we needed to look at  
19 modifying that \$1.60, and we concluded that that should  
20 now be raised. The lowest Class I differential should be  
21 raised to \$2.20.

22 Q. So isn't it true that one of the considerations  
23 for National Milk was that when you saw the third  
24 iteration, or maybe even the first and second at \$1.60,  
25 there were locations, especially in the West, Southwest,  
26 where the differential went down from the current  
27 location?

28 A. I believe there were some of those, yes.



1 Q. So how specifically did National Milk Producers  
2 Federation develop the base \$2.20 used in the model to add  
3 the \$0.60 to the \$1.60?

4 A. There will be, again, extensive testimony on that.  
5 But we used the basic framework that USDA used, that USDA  
6 and Federal Order Reform identified three components of  
7 that \$1.60, and we basically updated those three  
8 components.

9 Q. So just to be clear, in the \$1.60 today,  
10 transportation costs are not part of the \$1.60, are they?

11 A. No. They are part of the spatial differences.

12 Q. Did National Milk, in considering the development  
13 of the \$2.20 instead of \$1.60, include transportation  
14 costs in any way in that \$2.20?

15 A. I'm not sure that it officially incorporated  
16 transportation costs. There is a component of the cost of  
17 assuring a supply of Class I milk in one of the three  
18 factors. But our concern -- our -- our feeling was  
19 transportation costs were properly covered in the spatial  
20 differences that were solved for the University of -- in  
21 the University of Wisconsin model, as modified in some  
22 cases by the further work of our task force members who  
23 had knowledge of local market conditions that would not be  
24 reflected fully in the model.

25 Q. And I appreciate that. And, yeah, again, I'm  
26 going to have that opportunity to examine the other  
27 witnesses for National Milk, the members of National Milk.  
28 And again, I'm just trying to understand from you what



1 your understanding was.

2 So -- so you mentioned that there's the three  
3 elements of the \$1.60.

4 As I read the testimony, there's extensive  
5 discussion of the issue of Grade A in the testimony that's  
6 going to follow you, correct?

7 A. That is correct.

8 Q. And there's testimony about the inversion issue,  
9 correct?

10 A. That's correct.

11 Q. But I did not see any discussion about the other  
12 two factors in the base; is that correct?

13 A. What are other the two factors?

14 Q. I think one is viewed as balancing, and one is  
15 viewed as the cost of the incentive to get milk away from  
16 manufacturing facilities.

17 A. Okay.

18 Q. I did not see that in the discussion.

19 A. I thought those were two of the three.

20 Q. Right. Those are two of the three, and the  
21 Grade A is the third, correct?

22 A. Correct.

23 Q. I just wanted to be clear that as I read the  
24 testimony -- and there's a lot of testimony here and I  
25 could miss something -- as I read it, the discussion is  
26 focused on the Grade A and then separately this issue of  
27 inversion.

28 Am I correct in the universe there as I understand



1 it?

2 A. In terms of our testimony, I can't answer that. I  
3 think you will have to wait for the testimony to follow to  
4 speak for itself.

5 Q. Okay.

6 THE COURT: Mr. English, can you remember where  
7 you are and let us take a ten-minute break?

8 MR. ENGLISH: Absolutely, Your Honor.

9 THE COURT: Excellent. Let's go off record --  
10 well, first of all, when you come back. Come back at  
11 9:30. Let's go off record at 9:17.

12 (Whereupon, a break was taken.)

13 THE COURT: Let's go back on record.

14 We're back on record at 9:35 a.m.

15 Mr. English, you may proceed.

16 MR. ENGLISH: So I want to start where I left off,  
17 and then go backwards just for a couple seconds.

18 BY MR. ENGLISH:

19 Q. I understand and appreciate your comment that you  
20 believe there are other people who know more or the  
21 details of the 2.20, correct?

22 A. Yes.

23 Q. There's a lot of testimony.

24 So could you help me, which of the witnesses who  
25 are going to come after you are the best ones, in your  
26 view, to talk about the 2.20?

27 A. The first NMPF witness, Mr. Jeffrey Sims, will  
28 spend time in his testimony on the 2.20.



1 Q. Okay.

2 A. And Mr. Eric Erba is going to spend some time on  
3 that as well.

4 Q. So you think -- I -- I'm not saying others can't  
5 or won't, but those two --

6 A. Right. Those two are going to hit, you know, the  
7 main substance of that.

8 Q. I forgot to ask earlier because -- well, whatever  
9 reason.

10 When did National Milk receive the third iteration  
11 of the model?

12 A. That was, I think, as late as early October of  
13 2022.

14 Q. And in reference to a question I asked, you said  
15 that there were some modest number of changes to the  
16 model.

17 Is there anywhere we can find a summary of the  
18 changes?

19 A. Probably the best way to get that information  
20 is -- would be to -- to ask Dr. Nicholson from the  
21 University of Wisconsin because he received those changes  
22 and was responsible for making them, so he has that  
23 knowledge of the actual work of doing that.

24 But mostly it was basically plant lists, updating  
25 plant lists, and specifically the recommendation on the  
26 fuel costs to use. Which, as I had mentioned earlier, we  
27 intentionally did not want to have -- we wanted to have  
28 2021 fuel costs, which was, you know, prior to a major



1 escalation of those costs that occurred in 2022. We did  
2 not want to use the higher numbers of 2022.

3 Q. Do you recall whether he declined to accept any of  
4 your suggestions?

5 A. I don't recall that he declined to accept any of  
6 them. He was very interested in our knowledge for  
7 updating the model, and he very specifically did not  
8 indicate in any way that he thought any of the things that  
9 we provided him in the way of updated data were  
10 inappropriate for -- you know, for the purposes of his  
11 analysis.

12 Q. And I apologize because we actually just  
13 digressed, which was my fault.

14 What I was referring to was, when we were talking  
15 very briefly and just initially about the art that was  
16 applied after the third iteration, I thought we talked  
17 about the fact that there was sort of a modest number of  
18 modest changes; is that correct? By -- from the art?

19 A. How would you describe -- define changes?

20 Q. Okay. So you received the third iteration --

21 A. Yes.

22 Q. -- and after you received the third iteration,  
23 that's when your experts got together and consulted and  
24 applied, I thought you used the word art, correct?

25 A. Yes.

26 Q. And I thought, and I might -- we might have  
27 misunderstood or miscommunicated -- that you said that  
28 there were -- you know, those -- that art resulted in



1 modest changes to the results of the model.

2 Did I have that right?

3 A. Yes. But there were modest -- modest changes to  
4 the numbers that the model came out. We did not ask that  
5 any of those changes were incorporated back into the  
6 model.

7 Q. Okay.

8 A. The model was an objective thing. We were -- we  
9 were doing that art part, you know, before -- you know,  
10 during -- starting with -- with some of the earlier  
11 iterations, because we were under a timeline to present  
12 our final recommended price surface to our decision-making  
13 bodies.

14 Q. So -- thank you.

15 And I think you answered a question that you --  
16 you did not go back to the University of Wisconsin,  
17 when -- again, when you made the art changes, correct?  
18 You did not?

19 A. No, we did not.

20 Q. And so when I asked my question imprecisely and  
21 asked about the National Milk modifications to the numbers  
22 from the model, I was asking is there somewhere where  
23 there's a one-page or two-page or whatever summary of what  
24 those modifications were, or are?

25 A. I don't know of one that is publicly available.

26 Q. So essentially, one needs to read the 20, plus or  
27 minus, testimonies that are about to follow in order to  
28 get all of that?





1           A.     The testimonies that follow will describe in  
2     considerable detail where those -- those changes to the  
3     model results were made, which is very, very regional,  
4     very local, and therefore, the most pertinent.

5           Q.     So a moment ago you said that the process to  
6     provide the National Milk modifications started at some  
7     point prior, I think to the third iteration.

8                     Do you know when they started?

9           A.     Probably would have started sometime during --  
10    during the summer of 2022. I did not keep a log of all of  
11    these changes.

12          Q.     Were there central principles involved for the  
13    changes?

14          A.     The central principles were basically understood,  
15    you know, by the folks -- the task force members that were  
16    specifically going to work on that in their regions. And  
17    they were made based -- you know, by people who had done  
18    this sort of thing before. I can't tell you exactly  
19    which -- which process and procedures they were used for,  
20    but the people involved had experience with this, and so  
21    they kind of knew what was involved.

22                     You take, in this case, you know, the results of a  
23    computer model that does a wonderful job of getting you,  
24    pick a number, 90% of the way, but there inevitably --  
25    when you are doing something as important as setting -- of  
26    recommending what the Class I differential should be, you  
27    cannot take the results of a model, no matter how  
28    wonderful it is, without adding some particular --



1 particular things to it that based upon the institutional  
2 knowledge of experts who know about moving milk in their  
3 particular areas.

4 Q. Was somebody overall in -- for want of a better  
5 phrase, in charge of these committees?

6 A. Mr. Jeff Sims was formally the chair of the  
7 Class I surface working group, but there was no, you know,  
8 master plan. There was basically -- it was primarily, you  
9 know, getting -- getting the folks to get the work done  
10 and putting their individual expertise in. And  
11 particularly in the areas where there was no one person  
12 who had the detailed institutional knowledge of what the  
13 changes to the model for the Class -- you know, for the  
14 differentials in a particular region. Nobody in the group  
15 had that knowledge of every one of the 3100-some county,  
16 city, and parish differentials. It was a rather  
17 decentralized process.

18 Q. But were there sort of common precepts?

19 A. Yes.

20 Q. What were the common precepts?

21 A. The common precepts were things such as -- let me  
22 give you an example of the ones, because I was not  
23 detailed involved in a lot of this.

24 As I recall, the model showed that there should be  
25 a different differential for the cities in Texas of Dallas  
26 from Fort Worth, because those cities are some distance  
27 apart with respect to the major milk supply serving those  
28 cities in West Texas to the Texas Panhandle. For



1 institutional purposes, it was decided to -- that the  
2 differential, despite what the model said, should be the  
3 same for those two cities because of historic price  
4 alignment.

5 There was a considerable -- without being enslaved  
6 to the past, there was considerable effort and care taken  
7 to make sure that the updating did not do -- you know, I  
8 might say, you know, disruptive -- make -- make disruptive  
9 changes to existing price relationships, particularly, you  
10 know, amongst plants that are located relatively close to  
11 each other. We tried to respect the fact that the  
12 existing differential surface, even though it was  
13 outdated, imposed certain competitive relationships that  
14 we did not want to be disruptive of, to the extent  
15 possible.

16 Q. Okay. Anything else?

17 A. Oh, things like there was a feeling that the  
18 differences between cities or plants where there was a  
19 mountain range in between, where -- where travel times  
20 would be, you know, more difficult than -- than would have  
21 appeared based on the model results, some of those things  
22 needed to be modified.

23 And, again, you will -- you will receive  
24 voluminous testimony from those who have the expert  
25 knowledge in their areas of those -- exactly those kind of  
26 things.

27 Q. Believe me, I'm aware there's voluminous  
28 testimony.



1           Is it your understanding that the model does not  
2 take into consideration issues like mountain ranges?

3           A.    It must -- it -- it takes it into account -- the  
4 model basically uses standard road mileages between point  
5 to point, and it has several millions of those  
6 point-to-point arcs. It does not necessarily reflect  
7 differences in travel time for terrain. There are a lot  
8 of areas where there's a lot of congestion on roads where  
9 the travel -- travel distance would be a lot slower, and  
10 therefore more costly in terms of driver time than the  
11 model was able to take into account.

12           Again, the model does an incredible job of  
13 incorporating an awful lot of complexity, but there is  
14 another level of complexity that really needs to be -- to  
15 be taken into account to accommodate some changes from the  
16 results of even an almost perfect model.

17           Q.    Anything else?

18           A.    Those are things that I would mention at this  
19 point. And, again, you will hear many of them in the  
20 subsequent testimony.

21           Q.    So on page 6 of Exhibit 299, in the middle of the  
22 page, which is the fourth paragraph, and you refer to  
23 National Milk used the expertise of numerous individuals  
24 responsible for marketing milk in National Milk Producers'  
25 member cooperatives, as well as others that have  
26 longstanding expertise in the national Class I price  
27 surface.

28           Who were those others that have longstanding



1 expertise in the national Class I price surface who are  
2 not members of National Milk?

3 A. I did not imply that those were members outside of  
4 National Milk.

5 Q. Okay.

6 A. Those were particularly people who were -- who had  
7 knowledge of things like transportation, trucking costs,  
8 as opposed to people who necessarily were involved in the  
9 daily movement of milk. The people who were responsible  
10 for moving milk on a daily basis are the people we relied  
11 on to really have that -- that -- that boots-on-the-ground  
12 type knowledge of these sorts of things.

13 Q. Now, were trucking costs considered in the model?

14 A. The costs of transportation were included in the  
15 model, and I assume that that included however you define  
16 trucking costs.

17 Q. So I think I'm trying to ask -- and, again, maybe  
18 imprecisely -- with respect to the modifications, the art  
19 that National Milk employed after the model numbers came  
20 out, were there persons outside of National Milk who  
21 assisted you in providing analysis for those  
22 modifications?

23 A. I guess, how would you define outside of National  
24 Milk? I think the vast majority of those -- those changes  
25 were made by people who worked for National Milk  
26 cooperatives and were direct -- as directly involved in  
27 moving milk as -- as we thought was necessary for that  
28 purpose.



1 Q. So for instance, was Select Milk Producers  
2 consulted?

3 A. No.

4 Q. Was Edge Cooperative consulted?

5 A. No.

6 Q. What about the fluid milk proprietary customers,  
7 those who are members of IDFA, those who are members of  
8 the Milk Innovation Group, who are --

9 A. The only members of IDFA that I know we -- were  
10 involved were those who were also members of National Milk  
11 Producers Federation at the time.

12 Q. Was Organic Valley consulted?

13 A. Not to my knowledge.

14 Q. So do you know precisely who it was from National  
15 Milk who was in each back room where it happened?

16 A. I'm not aware there were any back rooms.

17 Q. Okay. These were closed-door meetings of National  
18 Milk members, correct?

19 A. Can you define closed-door?

20 Q. Well, we have just said that Select wasn't  
21 invited, correct?

22 A. Select was not a member of National Milk during  
23 most of that time.

24 Q. So what I'm getting at is, you know, you talked  
25 about employing the expertise of industry, while I think  
26 what you are telling me is the expertise in the industry  
27 was limited to National Milk members.

28 A. The expertise was based upon the task force that



1 we put together for National Milk, because we figured we  
2 had all the information, the objective information that we  
3 needed for this process.

4 Q. But, in fact, you know, you excluded two  
5 cooperatives, Organic Valley and Select, correct? Or  
6 three, actually, Edge. Edge, Organic Valley, and Select,  
7 correct?

8 A. We -- we invited anybody who wished to participate  
9 in the process, in the task force process who was a member  
10 of National Milk and was willing to supply the  
11 expertise -- time and expertise of their members -- of  
12 their staff that had the knowledge we needed.

13 Q. Was an invitation issued to anybody who was not a  
14 member of National Milk?

15 A. Not that I'm aware of.

16 Q. Wouldn't it be fair to say that entities like  
17 Select Milk Producers, Edge, Organic Valley, and members  
18 of IDFA who are proprietary operations would also have  
19 local knowledge of the markets?

20 A. Well, let's say if we wanted to have an open  
21 seminar or workshop and invited everybody in the country  
22 that might have been able to contribute, we would have had  
23 a much bigger process.

24 We felt that we had all the expertise we needed.  
25 We were not trying to exclude anybody. We were trying to  
26 get a job done, and we felt that we had the resources to  
27 do that.

28 Q. Wouldn't you agree that there's at least an



1 appearance of unfairness when some members of the industry  
2 get to give input to change the model results and others  
3 don't?

4 (Court Reporter clarification.)

5 BY MR. ENGLISH:

6 Q. Wouldn't you agree that there's at least an  
7 appearance of unfairness when some members of the industry  
8 get to give input to change the model results and others  
9 don't?

10 A. I don't think there's any -- any reason why  
11 that -- why that sense would be -- would be significant,  
12 you know. If you are telling me that you have that sense,  
13 that's your privilege.

14 Q. Would National Milk Producers Federation accept a  
15 model that has been modified by Select to specifically  
16 reflect markets where it has plants and understands the  
17 conditions in the market?

18 A. If Select chose to forward a model of that sort,  
19 we would take a look at it and see if -- and take a  
20 position on it. But that's -- there's -- that is not a  
21 proposal at this hearing.

22 Q. We have to -- we appear to have -- and I said 20  
23 earlier, and maybe that's because I was counting some  
24 other witnesses -- 17 National Milk witnesses discussing  
25 different regions on the departures from the model.

26 Are there others involved in the National Milk  
27 Producers Federation meetings only who made red-pencil  
28 adjustments who are not testifying?





1           A.     There may be some. I don't have a full list of  
2 those folks. But we feel that there's a very generous  
3 number of our task force members who are involved in the  
4 process who are going to provide extensive testimony on  
5 what they did in their area, and they will all be  
6 available to be cross-examined.

7           Q.     So what kind of horse trading went on in the back  
8 rooms given that some members operated Class I plants and  
9 others don't?

10          A.     I'm not aware of any horse trading. There were --  
11 no horses were involved, just colored pencils, electronic  
12 versions.

13          Q.     So when you look at the model results, the model  
14 provided by University of Wisconsin, gave you a May  
15 number, which is spring, and an October number, which is  
16 fall, correct?

17          A.     Correct.

18          Q.     And then National Milk calculated an average,  
19 correct?

20          A.     That's correct.

21          Q.     When National Milk made its modifications, did it  
22 consistently use one, that is to say, all spring, all  
23 average, or all fall?

24          A.     Could you define what you meant by all spring, all  
25 average, all fall?

26          Q.     All right. So you will have an opportunity in a  
27 moment to look at the spreadsheets.

28                 The University of Wisconsin provided you a column



1 of spring numbers, correct?

2 A. Correct.

3 Q. Which are generally, not exclusively, but  
4 generally lower than the fall, correct?

5 A. Correct.

6 Q. And then it provided a column of fall numbers,  
7 correct?

8 A. Correct. That's -- that's the way the model  
9 usually --

10 Q. Yes.

11 A. -- is run. A spring flush month and a fall --  
12 fall --

13 Q. Whatever.

14 A. -- tighter supply period month.

15 Q. As I asked, and you agreed, that National Milk  
16 added a column that was average, correct?

17 A. Right.

18 Q. Okay.

19 A. Because we knew that the Class I differentials in  
20 paragraph 1000.52 were a single number. They are not --  
21 they are not seasonably variable. So we knew that we had  
22 to work with a single number that combined the two, and  
23 the easiest way to do it was to take a simple average.  
24 And all of the art part of the process was based upon  
25 that -- the average numbers.

26 Q. Are you sure?

27 A. As far as I know. But you can, again, ask the --  
28 ask the individual groups that -- that made the



1 modifications to the model results. But to the best of my  
2 knowledge, we always worked with the average because we  
3 knew we had to come up with a single number.

4 Q. So you are not aware whether, for some locations,  
5 spring value was selected?

6 A. Not to my knowledge.

7 Q. And similarly, you are not aware whether in some  
8 instances the fall number was selected?

9 A. No. I don't recall where the difference between  
10 the spring and fall numbers was considered of great  
11 significance or taken as a major factor that was used in  
12 adjusting the numbers.

13 Q. What ultimately is the purpose of the model if it  
14 is so significantly altered?

15 A. Define significantly.

16 Q. I'll move on.

17 So on the bottom of page 2 -- the good news is I  
18 have moved on to part 2. This is page 2 of Exhibit 299,  
19 at least I thought it was.

20 You reference in your testimony that some precepts  
21 were followed from the Southeast hearing in 2007, the  
22 decision in 2008, correct?

23 A. That experience was -- was available to members of  
24 the task force, yes.

25 Q. Are you aware that in that case -- I think there  
26 were three people in this room who were at that  
27 proceeding -- in that case, SMA, followed by USDA, applied  
28 an 80% of hauling cost concept?



1           A.     I'm not aware of the details of the considerations  
2     in making that 2008 Southeast region differentials.

3           Q.     To your knowledge, is there any 80% of hauling  
4     cost concept applied in the National Milk Producers  
5     Federation modifications?

6           A.     I don't recall a fixed number because the  
7     transportation costs -- the primary impact of  
8     transportation costs in the National Milk recommendation  
9     in Proposal 19 came from the model, which is based upon  
10    the road network, the fuel costs, labor costs, and the  
11    like. It was basically from public sources. We did not  
12    dictate a particular transportation cost number to the  
13    University of Wisconsin personnel.

14           They -- we wanted their objective model results.  
15    The one thing we did ask was that they use fuel costs  
16    pertinent to the 2021 months and not the higher costs of  
17    the 2022 months that were available at that time.

18           Q.     And candidly, that would make sense, because if  
19    you are using May and October 2021 data, you would want to  
20    have the data match up, correct?

21           A.     Yes. We wanted it to be consistent. We did not  
22    dictate anything of what we wanted the model to show. We  
23    simply provide updated plant information, made the  
24    recommendation on using the cost from 2021, and most of  
25    the other data was already in the model.

26           Q.     So on the bottom of page 4 of Exhibit 299, the  
27    last paragraph, you state, "The combination of increased  
28    miles milk must move to serve Class I markets and the



1 significant increases in the per milk cost of moving milk  
2 is threatening the reliability for milk suppliers for  
3 Class I use in many Federal Orders."

4 So first I note you say "many Federal Orders,"  
5 which is not the same thing as all.

6 So in what Federal Orders is the increased cost of  
7 moving milk threatening the reliability of milk supplies  
8 in Class I?

9 A. You know, can you repeat the question again?

10 Q. Given the fact that you say "many" rather than  
11 "all" in this paragraph, which Federal Orders -- in which  
12 Federal Orders is the increased cost of moving milk  
13 threatening the reliability of milk supplies in Class I?

14 A. So in which orders it is threatening --

15 Q. Yes.

16 A. -- as opposed to --

17 Q. Yes.

18 A. Well, the Texas order is one that we have -- you  
19 know, that came to mind particularly, and there will be  
20 testimony on that.

21 The Texas market, population is growing. The main  
22 urban centers are in east and south Texas, and the milk  
23 supply in Texas, the local milk supply is moving from  
24 areas closer to those population centers, is moving out  
25 pretty -- pretty specifically to the Panhandle area in  
26 West Texas.

27 In areas closer to Dallas/Forth Worth, Houston,  
28 San Antonio, those more local milk supplies are declining.



1 And that's -- that was a kind of a -- a -- you know, a  
2 major example of areas where the milk supplies were moving  
3 to areas more distant from the consuming centers where the  
4 fluid milk plants were. Those hauling distances are  
5 increasing.

6 And there happens -- because the West Tex- -- the  
7 Texas Panhandle is an area of production growth, it is a  
8 fact of the current dairy industry that new plants are  
9 being built in areas where the milk supply is growing.  
10 Particularly, as the general patterns of consumption of  
11 dairy products are shifting from fluid to manufactured  
12 products such as cheese, butter, and ingredients for the  
13 growing export market and growing food manufacturing uses  
14 domestically.

15 So we have a situation where the milk supply is --  
16 the availability of manufacturing plants near the areas of  
17 milk supply is growing, and the availability of milk  
18 supplies closer to the fluid milk consuming areas is  
19 declining. And, therefore, hauling distances from where  
20 the milk is produced to where it's needed for Class I use  
21 are increasing. And you will see that in many of the  
22 testimonies to follow.

23 Q. I'm going to come back there, but -- okay.

24 Many Federal Orders, so after Texas, which is the  
25 Southwest order, what other orders are the increased costs  
26 of moving milk threatening the reliability of milk  
27 supplies in Class I?

28 A. I would leave that to the individual testimony.



1 You will have all the information you need on that.

2 Q. Okay. So let me come back to Texas. And I'm  
3 going to try to avoid pulling Exhibit 39 again, but you  
4 have been here for much of the hearing when we have talked  
5 about performance standards, correct?

6 A. Yes.

7 Q. And I need -- even just yesterday, I pulled  
8 Exhibit 39, which is the changes in performance standards,  
9 correct?

10 A. Can you define the performance standards, then?

11 Q. This is the order provisions with respect to what  
12 percentage of the milk needs to be, you know, shipped  
13 or -- to Class I plants, diversion limits --

14 A. Yes.

15 Q. Okay. That's what I mean.

16 A. Yes. I don't have particular expertise in  
17 applying those because we don't -- I don't -- we don't  
18 move milk in National Milk, but I'm aware of those --  
19 those provisions.

20 Q. But you know, one, that there's been no call for a  
21 hearing in Order 126, which is the Southwest Order, since  
22 some time in the mid-2000s to change those performance  
23 standards, correct?

24 A. Not that I'm aware of.

25 Q. And there's been no increase in the performance  
26 standards by the Market Administrator, correct?

27 A. Generally, the -- I'm not aware of increases in  
28 performance standards, but I -- I would not swear to that



1 under oath.

2 Q. Okay. So isn't it true that to the extent Class I  
3 handlers, who do not have an opportunity to depool, to the  
4 extent there is any quid pro quo for paying a Class I  
5 differential, that the point of that is to get milk to  
6 their plants, correct?

7 A. Can you repeat that question, please?

8 Q. You agree -- I'll break it up. You agree that  
9 Class I plants are the ones who are captive to the system  
10 and must always be in the pool, correct?

11 A. Pool distributing plants must pool their milk,  
12 yes.

13 Q. And whether explicit or implicit, the quid pro quo  
14 for that payment of a Class I price that is higher or at  
15 least generally higher than the other class is that they  
16 will have priority to get milk to the fluid plants,  
17 correct?

18 A. Could you define the parties to the quid pro quo  
19 that you are referring to?

20 Q. The order expressly provides, one, that Class I  
21 handlers will pay a Class I differential, the very thing  
22 that's at issue in Issue 5, correct?

23 A. Correct.

24 Q. Okay. The order also provides performance  
25 standards, that is to say if you want to be in the pool,  
26 for those people who don't have to pool, you have got to  
27 do certain things, correct?

28 A. That's correct.





1 Q. The point of those performance standards is to  
2 move milk to Class I plants, correct?

3 A. That's correct.

4 Q. Okay. I think we have heard a fair bit of  
5 testimony this hearing, maybe not by you, that a purpose  
6 of higher Class I plants is to cause or otherwise -- I  
7 think one person used the phrase "force" -- other classes  
8 of milk to pool.

9 Isn't it the case that since that pooling is  
10 voluntary, when you say that the increased cost of moving  
11 milk is threatening the reliability of milk supplies of  
12 Class I in Texas, what you really mean is that the Class I  
13 differential that is already being charged is so diluted  
14 that the people actually incurring the cost of delivery  
15 don't have an incentive to do so?

16 A. I don't know all the mathematics of that, but --  
17 but the -- our members are telling us that the return they  
18 are getting from supplying Class I milk, which is  
19 expensive, is not returning enough revenue given all of  
20 the costs that they are incurring to do it.

21 There's a parallel that I have pointed out, and  
22 you will hear it in other testimonies, that just as IDFA  
23 has provided testimony that the cost of manufacturing  
24 dairy products has increased and is not being covered by  
25 the current Make Allowances, a point in which our members  
26 generally agree, similarly, the cost of supplying Class I  
27 milk to fluid plants has increased, and that -- and the  
28 fundamental mechanism for ensuring that fluid plants get



1 adequate supplies of Class I milk are the Class I  
2 differentials. That's the basic foundation of the Federal  
3 Order program. Those current differentials are no longer  
4 adequate to the task, and we're proposing that they be  
5 adjusted for -- to conform with current realities.

6 Q. What I'm sort of specifically getting at here, is  
7 my understanding was when you say, on the bottom of  
8 page 4, that the combination of increased miles milk must  
9 move to serve Class I markets, and the significant  
10 increases in the per milk cost of moving milk is  
11 threatening the reliability for milk suppliers for Class I  
12 use, that you are making that statement as a justification  
13 for modifications of the University of Wisconsin model  
14 results.

15 Am I correct?

16 A. We believe the University of Wisconsin model  
17 results reflect that the reality of supplying milk, the  
18 cost of supplying milk to -- for Class I plants throughout  
19 the United States, and we use that as a basis to come up  
20 with our recommendations in Proposal 19.

21 Q. But as you have stated -- and I'll have the  
22 pleasure or opportunity, and so will Mr. Sims, to discuss  
23 at some length Texas -- you have gone through -- you,  
24 National Milk members, have gone through some significant  
25 effort to justify modifications to Texas from the  
26 University of Wisconsin model results, correct?

27 A. Correct. In general, the modifications that  
28 National Milk made based on the institutional knowledge of



1 their -- you know, our members' staffs that have expertise  
2 in their local markets were relatively modest compared to  
3 the -- to the results of the University of Wisconsin  
4 model, which is a greatly expanded and improved version of  
5 the model that was used by USDA to establish the current  
6 Class I differentials.

7 We didn't come with -- we didn't invent this  
8 process of using the University of Wisconsin -- previously  
9 Cornell University -- models as the basis and then making  
10 some fine-tuning adjustments from that. That was -- that  
11 was the procedure that the Department initiated in Federal  
12 Order reform to come up with the current differential  
13 structure which was considerably different than the  
14 previous one, which kind of zoned everything out of Eau  
15 Claire, Wisconsin.

16 Q. Well, let's not talk about Eau Claire.

17 So I think I'll probably move on, but I confess,  
18 I'm very confused about what's going on in Texas. And for  
19 those who know me, when I entered this wonderful business  
20 in 1985, it's because of Texas.

21 So I -- I -- what I'm trying to get at is if, as  
22 you say, there's all this new cheese production coming on  
23 in the Southwest because of the value of milk used in  
24 cheese versus fluid milk, why when we have declining milk  
25 supplies -- I'm sorry -- declining fluid milk consumption,  
26 if that is the case, why are we further increasing Class I  
27 prices?

28 A. We are proposing an increase in Class I prices to



1 account for the increased costs of supplying milk to  
2 Class I fluid plants for all the reasons of I have  
3 outlined, and you will hear in great detail by further  
4 witnesses.

5 The fundamental purposes of the Class I  
6 differentials is to provide -- facilitate the provision of  
7 an adequate supply of fluid milk for -- for Class I  
8 manufacturing. And, therefore, we are basically just  
9 updating the standard procedures for evaluating and, you  
10 know, the proper level of the Class I differentials, which  
11 have not changed, mostly, in almost a quarter of a  
12 century, while the costs that -- that -- and the  
13 structural changes in the dairy industry that are  
14 pertinent, directly pertinent to the proper level of the  
15 Class I differentials, have not changed.

16 We're simply proposing an update to the -- to the  
17 current Class I differential structure based upon the  
18 provisions of the -- of the Federal Order and its  
19 principles.

20 We are -- we are not aware that the 1937 Act  
21 indicates that the Federal Order program is responsible  
22 for making changes in the consumption of Americans -- of  
23 the American population of fluid milk.

24 Q. But shouldn't it be relevant -- you said in the  
25 quarter century since they've been modified, those costs  
26 have gone up. The same time in that quarter century,  
27 Class I utilization in Federal Orders, which now includes  
28 California, is down to 28%, and if you exclude Federal



1 Orders, it's 18%, correct?

2 A. Yes.

3 Q. So leaving aside all the testimony we have had  
4 about the Southeast, don't we really have a plentiful  
5 supply of milk, it's just that the incentives we have  
6 aren't getting to where it's needed?

7 A. Define plentiful supply of milk.

8 Q. I'd say 82% of milk being used in other than  
9 Class I is plentiful.

10 You don't agree?

11 A. No, I don't agree with that. Because  
12 manufacturing those -- transforming milk into those other  
13 dairy products in fluid is just as important to the -- you  
14 know, to the dairy industry as trans- -- as transforming  
15 that milk into fluid products.

16 Q. So both in your testimony on page 6, second  
17 paragraph, and in response to some of my questions, you  
18 have referred to alignment as one of the criteria for the  
19 National Milk modifications, correct?

20 A. Say that word again?

21 Q. Alignment.

22 A. Alignment?

23 Q. Correct.

24 A. Yes.

25 Q. Are you quite certain the National Milk has  
26 honored alignment in its private meetings?

27 A. Yes, to my knowledge. Our members who are  
28 actually responsible for supplying milk for Class I use



1 are acutely aware of the disruptions that can be caused by  
2 Class I differentials in, you know, nearby counties being  
3 out of alignment --

4 Q. Are you --

5 A. -- and they have sought to correct some of those.

6 Q. Are you aware of examples where National Milk  
7 Producers Federation's intent to ensure historical price  
8 alignment were made even if the model concluded that  
9 the -- that the values were significantly different?

10 A. I'm not aware that we made major changes in the  
11 alignment from the model results to the final Proposal 19  
12 results. I mentioned an example in Dallas/Fort Worth  
13 where the model showed, as you would expect, you know,  
14 where there's, what, a 30-some-mile difference between  
15 those, that there would be, you know, a small difference  
16 in the model results. For -- for -- you know, for other  
17 reasons we decided to -- to make them the same. We did  
18 not consider that to be a major deviation.

19 I'm not aware of anything where we -- where the  
20 model said the two nearby areas should be, you know, the  
21 same or, you know, roughly similar, and we ended up making  
22 them vastly different. We respected the general alignment  
23 scenario that the model gave us in almost all cases.

24 Q. For the red -- I think you used the word  
25 electronic pens, or computers, alterations, was there a  
26 limit on the modification size? That is to say, could it  
27 be more than \$0.10?

28 A. We looked at trying to keep the modifications from



1 the model as minimal as possible, but we did not, to my  
2 knowledge, say this is the maximum. We had a general  
3 sense of that and -- and again, the results show that  
4 those changes from the model results were relatively  
5 modest, particularly as a percentage of the Class I price,  
6 but I'm not aware that there was a binding limit, you  
7 know, you cannot -- you cannot come up with a change that  
8 was more than X dollars per hundredweight, or cents per  
9 hundredweight.

10 Q. So in answer to questions from your counsel, you  
11 indicated that the pages 12 through 82 of Exhibit 299,  
12 marked originally as Exhibit National Milk Producers  
13 Federation 35, contains the proposed county-by-county  
14 Class I differentials with the two corrections you made  
15 today, correct?

16 A. Correct.

17 Q. Where in National Milk Producers Federation's  
18 pre-submitted testimony can I find the county-by-county  
19 Class I differentials that resulted from any -- one or  
20 more -- of the University of Wisconsin model runs?

21 A. We submitted in our -- in everything we submitted  
22 to USDA in our petition, in our testimony, we basically  
23 used the structure of the Federal Order regulations in  
24 paragraph 1000.52 as a model, which -- which did not --  
25 which basically stated these are our recommendations for  
26 the differential. It was not a didactic exercise that we  
27 supplied that information where we wanted to show  
28 everything we did. We're not trying to hide anything, but



1 we did not feel in our formal request to the Department  
2 and our testimony that it was necessary to provide all  
3 that information.

4 Q. So let me just be clear. The one set of numbers  
5 that I believe -- and I could be wrong -- that are  
6 pre-submitted or at this point you have submitted as  
7 Exhibit 299 for the proposed class and differentials and  
8 any justification for them in terms of the -- as opposed  
9 to what testimony I'm going to get -- is found on pages 12  
10 to 82 as corrected of this exhibit, correct?

11 A. That is our Proposal 19. You will hear plenty of  
12 testimony from -- from task force members in their own  
13 areas of the specific changes they made to the model  
14 results and how they modified them based upon their  
15 additional information.

16 Q. Now, to be clear, as you referenced a minute ago,  
17 the petition that you made to USDA and information  
18 supplied to USDA, absent somebody putting that into this  
19 record, whatever you filed with your actual petition and  
20 the backup materials that might have been submitted, are  
21 not part of the record unless somebody makes them part of  
22 the record, correct?

23 A. The only thing I'm aware of as part of the record  
24 is the differentials that we proposed in Proposal 19.

25 Q. Which are found in Exhibit 299, correct?

26 A. Correct.

27 Q. But, in fact, National Milk Producers Federation  
28 submitted to USDA significant spreadsheets with respect to





1 the model runs and National Milk's -- back in May and  
2 June, correct?

3 A. Yes. I believe that we provided our -- you know,  
4 the model information to the Department as pertinent  
5 information to support our proposal.

6 Q. Okay. But at least as of this moment, they are  
7 not in the record, correct?

8 A. I have not seen them in the record.

9 Q. Is National Milk planning to put them in the  
10 record?

11 A. I can't answer that because I don't know the  
12 answer to that question.

13 Q. All right.

14 MR. ENGLISH: Your Honor, it may make sense to go  
15 off the record as I pass out -- we pre-filed MIG-29 and  
16 MIG-30, I have lost track, Monday night, so it's been  
17 available since, you know, USDA posted it at least Tuesday  
18 morning. And, of course, what I will pass out has been on  
19 the USDA hearing website, if not an exhibit, since this  
20 summer, so it's not a surprise to anybody I believe. But  
21 if I may hand them out.

22 So pursuant to the rules, my understanding is that  
23 we must provide four printed copies as a courtesy.  
24 Notwithstanding the expense, we have 25 with us. We can't  
25 share, you know, one for every single person, but we  
26 wanted to make available obviously to Your Honor, the  
27 witness, myself, and a few others. But we have the four,  
28 I believe in color, and to save a few pennies, the others



1 are black and white. So if we can go off the record to  
2 distribute these.

3 THE COURT: All right. Let's do. I need to  
4 stretch some, too, so let's take ten minutes. So please  
5 be back and ready to go at 10:40.

6 We go off record at 10:27.

7 (Whereupon, a break was taken.)

8 THE COURT: Let's go back on record.

9 We're back on record at 10:41 a.m.

10 MR. ENGLISH: So, Your Honor, we have passed  
11 things out. I think USDA is still maybe marking. I don't  
12 believe you have a copy at the moment. I don't believe  
13 the witness has a copy.

14 THE COURT: So mine comes from Emily. And are  
15 they already marked? Okay.

16 MR. ENGLISH: Okay. So I earlier said MIG-29 and  
17 30. I should have said MIG-28 and 29.

18 So I would ask that MIG-28 be marked as 300. I  
19 believe National Milk is disappointed but -- you know,  
20 they are not 300 on this but -- and that MIG-29 be 301.

21 Is USDA going to supply a copy to the witness or  
22 do we need to provide that?

23 MS. TAYLOR: We can give a copy.

24 THE COURT: Okay. We remain on record. I just  
25 want to state how we mark these. It is, as Mr. English  
26 requested, Exhibit MIG-28 is Exhibit 300.

27 (Exhibit Number 300 was marked for  
28 identification.)



1 THE COURT: Exhibit MIG-29 is 301.

2 (Exhibit Number 301 was marked for  
3 identification.)

4 THE COURT: I am one of the blessed people who has  
5 colored copies, but there's not much colored, actually, is  
6 there, Mr. English? The person that has black and white  
7 is not disadvantaged.

8 MR. ENGLISH: Well, since I don't have one in  
9 black and white, I can't say. Even with my eyesight, I  
10 believe they are not disadvantaged.

11 And by the way, I want to note that as we passed  
12 them out, we passed them out in one binder clip so that --  
13 that those people in the audience should note that MIG-28  
14 is the first 54 pages of what was passed out with one  
15 binder clip, and then MIG-29, which is now Exhibit 301, is  
16 the 54 pages that follow. So if you are confused because  
17 you have only one big document, it's because we -- in  
18 order to produce them and pass them out, we did it that  
19 way, but they are two separate documents.

20 THE COURT: And just for the record, Mr. English,  
21 what size paper is this that they are printed on?

22 MR. ENGLISH: I believe it is 11x17.

23 THE COURT: Thank you.

24 MR. ENGLISH: And the people who actually know say  
25 I'm right.

26 THE COURT: Very good.

27 MR. ENGLISH: So as I said before we went off the  
28 record, Your Honor, electronic versions were submitted to



1 USDA Monday night, but also I would note that these were  
2 submitted by National Milk to USDA.

3 It's my understanding that Exhibit 300 was  
4 submitted in May of this year, and that Exhibit 301 was  
5 submitted in June of this year. But I can -- I can ask  
6 the witness some questions.

7 Further, Your Honor, I represent that these  
8 documents that were submitted, were downloaded from the  
9 USDA website, and the only change is the header and footer  
10 where we added MIG Exhibit Number 28 or 29, and pages 1 of  
11 54 as requested by USDA for submissions.

12 I also note that each document at the bottom has  
13 the URL where they can be found -- very small print, but  
14 it's there -- and I'm not going to attempt to read that,  
15 as they are on both the paper copies and the electronic  
16 version.

17 THE COURT: Thank you, Mr. English. And you may  
18 continue to question.

19 BY MR. ENGLISH:

20 Q. So, Doctor, do you recognize Exhibit 300?

21 A. Yes.

22 Q. And this was submitted to USDA by National Milk in  
23 May of 2023?

24 A. Yes, I believe so.

25 Q. And similarly, do you recognize Exhibit 301?

26 A. Yes.

27 Q. And was that submitted to USDA in June?

28 A. I will take your word for it, those dates of



1 submission. We did -- we did supply this information to  
2 USDA. And to my understanding, that the -- Dr. Nicholson  
3 is intending to also enter these similar information into  
4 the record.

5 Q. Well, actually, that anticipates my next question,  
6 because it is -- would you agree with me that -- so let me  
7 say for the record that there are column letters A through  
8 S on Exhibit 300, and column letters -- well, it goes  
9 through S, but there's no numbers past O, so A through O  
10 on 301.

11 And so when you say that Dr. Nicholson will supply  
12 something, in fact, he can supply only a part of this,  
13 correct? Because --

14 A. I'm not sure what he's planning to supply, but in  
15 terms of the basic information, we -- we have not intended  
16 to keep this private. This is -- we have made this  
17 information available.

18 Q. Sir, I did not mean in any way, shape, or form to  
19 imply that's what it was. I, frankly, was concerned --  
20 lest somebody think it was part of the record, I have had  
21 an off-the-record conversation with one of our colleagues  
22 here who was, like, oh, I didn't realize this wasn't in  
23 the record. So it certainly is not implied. Obviously we  
24 have had access to it, so I don't disagree that it's been  
25 public.

26 A. Yep.

27 Q. Absolutely. But -- but let me -- let me see if I  
28 can be clear. And so let me run across the columns with



1 what has been called for me, my magic decoder pen.

2 So I want to start and discuss Columns A through  
3 E, and then Columns F and G.

4 Column A is simply a model county identification  
5 number, correct?

6 A. Yes. Sequential numbers 1 through presumably  
7 3100-something.

8 Q. And Column B is the county -- county name,  
9 correct?

10 A. County, city, or parish.

11 Q. County, city, or parish, thank you for the  
12 clarification.

13 And Column C is the state name, correct?

14 A. Correct. I'm working from the first page.

15 Q. The state abbreviation, correct?

16 A. Correct.

17 Q. And then the Column D is actually the full state  
18 name, correct?

19 A. Correct.

20 Q. Then we have column E which is called the FIPS  
21 code.

22 Do you -- we may have to ask Dr. Stephenson, but  
23 do you know what the FIPS code is?

24 A. It seems to be a code that identifies individual  
25 counties.

26 THE COURT: And just for the record, would you say  
27 the letters that comprise "FIPS"?

28 MR. ENGLISH: F-I-P-S.



1 BY MR. ENGLISH:

2 Q. Okay. And those all came from the University of  
3 Wisconsin model, correct?

4 A. Correct.

5 Q. They were delivered to National Milk as a --

6 A. They correspond to what's currently listed in  
7 terms of identifying county, cities, and parishes in  
8 paragraph 1000.52.

9 Q. And then Column F is the model result for the  
10 spring, or May of 2021, correct?

11 A. Yes.

12 Q. And this is the result of the third iteration,  
13 correct?

14 A. I believe so.

15 Q. And so Column F came from the University of  
16 Wisconsin, correct?

17 A. Correct. But you will need to direct that  
18 question also to Dr. Nicholson to confirm.

19 Q. And I -- I have a cross-examination for him. So,  
20 yes. Thank you, though.

21 But -- but you -- your understanding is that  
22 Column F came from the University of Wisconsin model?

23 A. This is the way we received the model results. I  
24 cannot confirm every single number in there. But I -- I  
25 assume that this is -- if it came from the website, I  
26 assume this is the correct final model results.

27 Q. Okay. And then we have Column G, which is the  
28 equivalent of Column F, but this time, however, it's the



1 fall or October 2021 University of Wisconsin model result,  
2 correct?

3 A. Correct. Correct.

4 Q. Okay. Am I correct that once we get past  
5 Column G, everything else on columns -- Exhibits 300 and  
6 301 were derived not from the University of Wisconsin  
7 directly, but from National Milk?

8 A. It appears to be so. You are taking differences  
9 between the May and October results, you are taking  
10 differences between the May results and current, and same  
11 thing with October.

12 Q. So to be clear, if we just put, you know,  
13 something over the document, you know, everything left of  
14 the line between G and H came from the University of  
15 Wisconsin, correct?

16 A. Specifically E -- excuse me -- F, G really were  
17 the main things that came from the model.

18 Q. Okay.

19 A. Everything else, you know, the model results  
20 included a lot of these calculations, but the guts of what  
21 came from the model are Columns F and G.

22 Q. Okay. And I guess what you are saying is  
23 Columns A through E are basically effectively lining up  
24 with the Federal Order language?

25 A. Labels.

26 Q. Labels, okay.

27 A. Yes.

28 Q. And then -- but everything to the right, so to





1 speak, so Columns -- on 300, Columns H, I, J, K, L, M, O,  
2 P, Q, R, S, were added by National Milk, correct?

3 A. I assume so, because they are -- just knowing how  
4 spreadsheets work, these look like they are fairly simple  
5 calculations from Columns E, F, and the current  
6 differentials, and basically what's currently in  
7 paragraph 1000.52.

8 Q. And so maybe this would be the better way to ask  
9 the question.

10 Dr. Nicholson did not provide the information in  
11 those calculations done in Columns H through S, correct?

12 A. I don't recall exactly what -- what -- what was --  
13 there were some calculations that the -- Dr. Nicholson's  
14 provided, just as output. But these were -- in all cases,  
15 those are simple comparisons, very simple calculations.  
16 And anybody -- whoever made them, they were pretty  
17 straightforward calculations.

18 Q. So while you and I may believe they are  
19 straightforward calculations, for purposes of the record,  
20 let's see if we can quickly go through.

21 So Column H is labeled October to May differences.  
22 So what is that, exactly?

23 A. That is a difference between the numbers on each  
24 line and from -- between Columns G and Column F.

25 Q. And Column I labeled current differential at -- is  
26 basically if you go to part 1000.50 adjusted for the  
27 Southeast in 51, that's the current differential, correct?

28 A. Yes. Adjusted for the Southeast, yes.



1 Q. And then Column J says May-current.

2 What is May-current in Column J?

3 A. That's the difference between the number in  
4 Column A on each line and the number in Column I.

5 Q. I'm sorry, did I hear you say A or did you mean --

6 A. Excuse me, F. Column F and Column I.

7 Q. And then -- so K would be the difference between  
8 Column G and Column I?

9 A. That's correct.

10 Q. Okay. And then Column L, what is Column L?

11 A. Column L should be the average of the numbers in  
12 Column F and Column G.

13 Q. And then so Column M is the difference between  
14 Column L and Column J?

15 A. Column -- Column I.

16 Q. I. Thank you.

17 THE COURT: State again in one sentence what it's  
18 the difference of?

19 MR. ENGLISH: Thank you.

20 BY MR. ENGLISH:

21 Q. Column M is the difference between Column L and  
22 Column I, correct?

23 A. That's correct.

24 Q. And Column N is certainly the Federal Order number  
25 where the county is located, correct?

26 A. Yes. If the county is located in the marketing  
27 area of the Federal Order, that Federal Order number is  
28 given in Column N.



1 Q. Okay. And then Column O is proposed Class I,  
2 correct?

3 A. Yes. That is the -- that is the proposed number  
4 that was in Proposal Number 19.

5 Q. So I'm a little confused. Column O is labeled  
6 Proposed Class I, and Column S is New Proposal.

7 How are Column O and Column S different, if you  
8 know?

9 A. Can you repeat that?

10 Q. So I'm looking at Column O, which is labeled  
11 Proposed Class I, and then I look over at Column S, where  
12 the label is New Proposal. And I don't know if they are  
13 duplicative or not.

14 Can you explain why there are two columns and  
15 whether or not they are the same or different, if you  
16 know?

17 A. No, I don't know. They appear to be the same.

18 Q. Then Column P is proposed versus current, which  
19 would be, I believe, Column O minus Column I, correct?

20 A. That's correct.

21 Q. And then Column Q is proposed versus -- so it says  
22 proposed versus model average, which I take it would be Q  
23 minus L; is that correct?

24 A. Yes.

25 Q. And then there's a column labeled R, average  
26 monthly pounds, 2022, in millions.

27 Can you please explain that?

28 A. I would assume that that is the average monthly



1 pounds that the -- that the model had assigned to each of  
2 those individual counties, cities, and parish. But that's  
3 a question, again, for Dr. Nicholson.

4 Q. Well, are you sure it's for Dr. Nicholson?  
5 Because I don't know if he provided that data or you did.

6 A. I don't recall that we went through and -- and  
7 interpolated the more aggregated numbers that were  
8 available for the pounds of milk. I assume that refers to  
9 pounds of milk.

10 Q. Okay.

11 A. I'm not aware that National Milk did a  
12 disaggregation to the county, city, parish level for all  
13 3100-plus counties.

14 Q. Okay.

15 A. My sense is this calculation was made by somebody  
16 else, but that can be clarified -- that can be clarified  
17 if you ask it to enough of our witnesses.

18 Q. Thank you.

19 THE COURT: Mr. English, I want you to go back to  
20 Column Q and again ask the witness how that is calculated.

21 MR. ENGLISH: I believe, but the witness can  
22 correct me, that Column Q is Column P minus Column L.

23 THE WITNESS: Minus Column?

24 BY MR. ENGLISH:

25 Q. L.

26 A. Yes.

27 Q. Am I right?

28 A. That's correct.



1 Q. Okay. I'm sorry, it's Column O. I apologize,  
2 it's Column O --

3 A. Column O minus Column L.

4 MR. ENGLISH: I'm not sure how many times I'm  
5 going to get that wrong, Your Honor, so let me try it  
6 again. And I thank my extremely helpful colleague.

7 BY MR. ENGLISH:

8 Q. So Column Q is Column O, labeled Proposed Class I,  
9 minus Column L, which is labeled UofW v3 -- for I think  
10 iteration 3 -- average.

11 Would that be correct?

12 A. That's correct. So, for example, that very first  
13 line of Autauga County, Alabama, that indicates that the  
14 changes made to the final model results resulted in a  
15 lowering of the differential in Autauga County, Alabama by  
16 \$0.20.

17 MR. ENGLISH: May I consult with my colleague for  
18 one moment, Your Honor?

19 THE COURT: Certainly, yes.

20 Let's go off record. It's 11:00 a.m.

21 (An off-the-record discussion took place.)

22 THE COURT: And let's go back on the record. It's  
23 still 11:00 a.m.

24 THE WITNESS: Time is standing still.

25 BY MR. ENGLISH:

26 Q. So as it happens, I needed a tiny bit of help from  
27 my consultant, and I probably should have known myself,  
28 given the fact that I am from the Commonwealth of



1 Virginia.

2 (Court Reporter clarification.)

3 BY MR. ENGLISH:

4 Q. So I think, again, for the benefit of the record,  
5 when we turn -- because Your Honor noted color, but I  
6 think there's some modifications.

7 Pages 49, 50, and 51, do have some additional  
8 color, not blue, but yellow or orange. And I believe  
9 you're closely enough connected to the Washington, D.C.,  
10 Metropolitan Area that you can probably understand where  
11 I'm going with this.

12 A. I don't have a color copy.

13 THE COURT: The witness should have a color copy.

14 MR. ENGLISH: Can I hand it to him for a moment,  
15 Your Honor?

16 THE COURT: No, I'm going to exchange. I'm going  
17 to take what he's got.

18 THE WITNESS: If you are going to ask me a  
19 question about colors, I need to see what the colors are.

20 MR. ENGLISH: I apologize.

21 THE COURT: And I don't -- I can follow along  
22 without them, and I have not marked them in any way.  
23 Thank you so much.

24 THE WITNESS: Thank you.

25 BY MR. ENGLISH:

26 Q. So if we look -- let's just start with 49, and  
27 I'll try to keep this really short.

28 THE COURT: But don't go fast.



1 MR. ENGLISH: Point taken, Your Honor.

2 BY MR. ENGLISH:

3 Q. So Virginia is a jurisdiction where there are  
4 cities that -- and counties, and sometimes cities are  
5 inside counties, correct, Doctor?

6 A. Virginia has cities and counties. I'm not sure  
7 that the cities are incorporated in the counties or  
8 whether they are separate.

9 Q. Okay.

10 A. Like, I live next door to City Falls Church and  
11 Fairfax County, but I do believe that those are separate.

12 Q. They can be separate. But you can live in Falls  
13 Church for Postal Service purposes, and yet be in Fairfax  
14 County, correct?

15 A. I'm not aware of exactly what's the territory of  
16 Fairfax County and whether it incorporates it.

17 MR. ENGLISH: Your Honor, maybe I'll just shorten  
18 it. I don't think there's any controversy here.

19 THE WITNESS: If you know the facts, I will accept  
20 your word.

21 BY MR. ENGLISH:

22 Q. I want to make a representation for the record.

23 Having, you know, gone to the University of  
24 Virginia, which is in Charlottesville, Virginia, and  
25 Charlottesville, Virginia is inside Albemarle County, and,  
26 in fact, the Albemarle County courthouse is across the  
27 street from the Charlottesville courthouse.

28 A. I will take your word for it to speed things



1 along.

2 Q. And similarly, as I look through what are marked  
3 as yellow and orange, every single one of these is an  
4 instance where there's a -- there's a city that is located  
5 in or connected to a county. And I also grew up in Falls  
6 Church, but I grew up in the part of Falls Church that is  
7 part of Fairfax County.

8 And so I think to simplify the conversation, it  
9 would just say that when we see these yellow and oranges,  
10 they are not significant in any material way because they  
11 just describe a peculiarity of the Commonwealth of  
12 Virginia.

13 MR. HILL: Mr. English? For those following  
14 electronically, could you tell us what line you are on  
15 rather than the page number --

16 MR. ENGLISH: Okay.

17 MR. HILL: -- to the left.

18 MR. ENGLISH: Okay. So I'll go through the line  
19 numbers: 2790 is Alexandria City; 2801 is Bristol City;  
20 2805 is Buena Vista City; 2811 is Charlottesville; 2812 is  
21 Chesapeake City; 2815 is Colonial Heights; 2816 is  
22 Covington; 2820 is Danville City; 2823 is Emporia.

23 THE COURT: Now, let me stop you. Even with my  
24 black and white copy, I can see the highlighting of  
25 everything that you are reading, so I don't think you need  
26 to read them all, but --

27 MR. ENGLISH: I'm fine stopping, if that's okay.

28 MR. HILL: It's just that online it doesn't have





1 the page numbers. I just needed to know where you were.

2 MR. ENGLISH: Okay. So it's Virginia, starting at  
3 2789, which is Albemarle, and it runs through the end of  
4 Virginia, which is line number 2920, York.

5 MR. HILL: Thank you very much.

6 MR. ENGLISH: Okay. Thank you, sir. I'm happy  
7 not to read them all in.

8 THE COURT: And is the Commonwealth of Virginia  
9 the only batch of lines that has this polarity?

10 MR. ENGLISH: Looking through it very quickly,  
11 Your Honor, yes.

12 THE COURT: Makes you proud, doesn't it?

13 MR. ENGLISH: Wahoo-wa.

14 BY MR. ENGLISH:

15 Q. All right. Okay. So I am really not going to  
16 spend a lot more time on all this, but I am going to try  
17 to clarify.

18 So let's start with -- let's turn to Exhibit 301.

19 A. Do you want me to keep the pages that you just  
20 referred to on number 300 or are we done with those?

21 Q. We can give those back to the judge and switch if  
22 you want.

23 THE COURT: No, no, no, I want the witness to keep  
24 that. Thank you.

25 MR. ENGLISH: I just remembered the answer. All  
26 right.

27 BY MR. ENGLISH:

28 Q. So we turn to 301, first it's labeled at the top,



1 June 2023, at the very top in the header.

2 Are you in 301?

3 A. Yes, I am.

4 Q. Okay. And so would this refresh your recollection  
5 that if it's labeled June 2023, it was probably submitted  
6 in June 2023?

7 A. I see it listed as such, yes.

8 Q. I should have started there. So this -- this is  
9 different in one, at least to me, obvious respect, which  
10 is that through Columns A through Column N appears to be  
11 identical to Columns A through Columns N on Exhibit 300.

12 Do you agree?

13 A. It would appear such.

14 Q. Okay. And then it appears that this omits  
15 Exhibit 300, Columns O, P, Q, R, and substitutes with a  
16 caveat Column S for Column O. And I'll come back to the  
17 caveat in a second.

18 Is that -- is that correct that -- that maybe  
19 there's some differences between S and O in between 300  
20 and 301, but in essence, you have fewer columns and you  
21 have omitted O, P, Q, R from Exhibit 300?

22 A. Columns O, P, Q, and R are basically -- Column O  
23 is significant because that's the final results on  
24 Exhibit 30, the rest are just calculations. But I cannot  
25 testify exactly what -- in Exhibit 300 is -- Column S is  
26 labeled as New Proposal and Column O is listed as  
27 Proposal.

28 Q. Okay. And do you know -- if you don't, that's



1 fine -- whether there's any differences between the  
2 numbers that appear in Column S and the numbers that  
3 appear in -- Column S, Exhibit 300, and Exhibit 301,  
4 Column O?

5 A. I do not know the answer to that question, because  
6 I have not had time to go through and compare them line by  
7 line.

8 THE COURT: And, Dr. Vitaliano, you mentioned  
9 Exhibit 30, and you were looking at 300 at the time.

10 THE WITNESS: 300 and 301.

11 THE COURT: Thank you.

12 MR. ENGLISH: Your Honor, I only have a few more  
13 questions, but for housekeeping, I move the admission of  
14 Exhibits 300 and 301 having laid, I think, a sufficient  
15 foundation.

16 THE COURT: Is there any objection to the  
17 admission into evidence of Exhibit 300?

18 There is none. Exhibit 300 is admitted into  
19 evidence.

20 (Exhibit Number 300 was received into  
21 evidence.)

22 THE COURT: Is there any objection to the  
23 admission into evidence of Exhibit 301? 301?

24 There is none. Exhibit 301 is admitted into  
25 evidence.

26 (Exhibit Number 301 was received into  
27 evidence.)

28 ///



1 BY MR. ENGLISH:

2 Q. So keeping the two exhibits handy -- and I want to  
3 go to --

4 THE COURT: Be closer to the mic.

5 MR. ENGLISH: Thank you. It's a little hard, the  
6 size of the documents, but thank you.

7 I want to go to FIPS, F-I-P-S, Column E, code  
8 27053, which is on page 23 for those in the hearing room.

9 THE COURT: The line number?

10 MR. ENGLISH: I'm getting there.

11 THE COURT: Oh, okay.

12 MR. ENGLISH: I'm sorry, I had it and then I lost  
13 it.

14 27053 is -- so it's line number 1307 ironically  
15 under ID, because there's one number off, it's 1307, which  
16 is Hennepin County, Minnesota, otherwise known as  
17 Minneapolis.

18 THE WITNESS: I see that as 1308.

19 BY MR. ENGLISH:

20 Q. I understand it's 1308 on the line number. So  
21 let's just omit Column A for this, because the way the  
22 line numbers work --

23 A. Okay. And they are sequential.

24 Q. They are off by precisely one between the ID and  
25 the line number.

26 So let's use line number 1308. And the Column E  
27 is FIPS Code 27053, and it's Hennepin County, Minnesota.

28 And I note, you would agree, that the model spring



1 is 2.60 in Column F, correct?

2 A. Correct.

3 Q. And for Row 1308, Column G, the October number in  
4 Column G is 2.70, correct?

5 A. Correct.

6 Q. And --

7 THE COURT: Now, do you want the transcript to  
8 show \$2.60?

9 MR. ENGLISH: Yes, \$2.60 and \$2.70. All of these  
10 numbers are in dollars. I will try to remember to say  
11 that.

12 THE COURT: Thank you.

13 BY MR. ENGLISH:

14 Q. And if we go over to Column L, which is labeled  
15 University of Wisconsin version 3, average, the average is  
16 2.65, correct?

17 A. Correct.

18 Q. And if we go all the way over to the right in  
19 Column S, the proposal, under 2 -- new proposal, it's  
20 2.80, correct?

21 A. Correct.

22 Q. Now let's go to Exhibit 3. So let's remember  
23 that's 2.80 from Exhibit 300.

24 So let's please go to Exhibit 301, the June  
25 submission, same FIPS code. So I will repeat, 27053,  
26 page 23 for those who have a copy here, line 1308,  
27 Hennepin County. And I would ask you to go all the way  
28 over to the right in Column O, and you see \$3, correct?



1 A. That's correct.

2 Q. So what changed, in National Milk's view, from the  
3 May submission to the June petition where Proposal 19 went  
4 to \$3, which is \$0.20 higher than was submitted in May?

5 A. Well, to get the definitive answers, again, you  
6 need to direct that question to the witness who will  
7 testify in that area. But it was an iterative process.  
8 Anybody who's done this kind of analysis knows that you  
9 don't often get the perfect number the first time. You  
10 need to double-check, you need to look at a number of  
11 things, and, you know, those things will change. At some  
12 point you have to say this is final and -- and submit, in  
13 this case, your final numbers in the form of a proposal.  
14 And so that number changed by \$0.20, given these  
15 documents, and you'd have to ask the person who was more  
16 directly involved what caused that change.

17 But as an analyst, there's nothing very surprising  
18 about this process to me.

19 Q. Now, if we stay on Exhibit 301 in the same FIPS  
20 code, for Hennepin County, you have a proposal for \$3, and  
21 a Column I, current differential, and \$1.70.

22 So you would agree that you are proposing, in  
23 Proposal 19, to increase the Class I differential in  
24 Minneapolis by \$1.30, correct?

25 A. Okay. Which exhibit are you in?

26 Q. I'm still in Exhibit 301.

27 A. What's the MIG number?

28 Q. 29.



1 A. Okay. Are you still on Hennepin County?

2 Q. I'm still on Hennepin County. In Column I is the  
3 current differential is \$1.30; in Column O is \$3.

4 And you would agree with me that that difference  
5 is \$1.30 higher, correct?

6 A. I see Hennepin County, Column I is \$1.70.

7 Q. Right. And Column O is \$3, correct?

8 A. Correct.

9 Q. And maybe the easiest thing we're going to do  
10 today is you subtract \$1.70 from \$3 and you get to \$1.30,  
11 correct?

12 A. That's correct.

13 Q. And that's an increase, correct?

14 A. That's an increase in the number in the column  
15 labeled Proposed from the current differential.

16 Q. Okay. Going back to our conversation before  
17 either break, given the Class I utilization in the Upper  
18 Midwest, which I think is around 5 to 8%, what is the  
19 justification for increasing the Class I differential in  
20 Minneapolis by \$1.30?

21 A. The justification is basically the purpose of  
22 price alignment. We had to look -- each county,  
23 particularly counties with a -- with a city, or you know,  
24 milk plants in them, had to be aligned with those from  
25 other areas, and that was one of the overriding  
26 considerations in coming up with our proposed  
27 differentials.

28 Again, in terms of the specifics, you need to



1 direct that question to the person who will be testifying  
2 specifically in that region that includes Hennepin County,  
3 Minnesota.

4 Q. And I am reminded that maybe I have been imprecise  
5 in my questions, so let me backtrack for one moment.

6 Is it your understanding, if we look at MIG-29,  
7 which is what you have, which has been marked as  
8 Exhibit 301, that except for the two changes you told us  
9 about earlier today, what is found in Column O is -- in  
10 your understanding, is what is NMPF-19?

11 A. NMPF Proposal 19?

12 Q. Yes.

13 A. I'd have to double check that to give you an  
14 affirmative answer, but I have no reason to question why  
15 that is not the case. I don't have -- I don't have the  
16 numbers in Proposal 19 as I submitted them in front of me.

17 Q. Okay. So I want to turn next, I want you to  
18 remember what we did in Minneapolis with the \$1.30  
19 increase, which, by the way -- let me go back. Let me  
20 strike that.

21 So I want to go to FIPS code 12086, which is  
22 Miami-Dade, Florida.

23 THE COURT: Which is what?

24 MR. ENGLISH: Miami-Dade, Florida.

25 MR. HILL: Line number?

26 MR. ENGLISH: I'm getting there. 12086 for those  
27 in the room. It's on page 6, and 12086 is line  
28 number 335.





1 MR. HILL: Thank you.

2 BY MR. ENGLISH:

3 Q. I'm looking on Column F, FIPS code. And I'm only  
4 looking at Exhibit 301, which is Exhibit MIG-29.

5 And I want to walk you through -- so under  
6 Column F, from the University of Wisconsin, for May we  
7 have \$7.40?

8 A. Yes.

9 Q. And for Column G, we have \$8.40?

10 A. Correct.

11 Q. And then the average under Column L, University of  
12 Wisconsin average, is \$7.90, correct?

13 A. Correct.

14 Q. And Column O is also \$7.90, correct?

15 A. Correct.

16 Q. And so for all of this conversation in this  
17 hearing about the need for more milk in the Southeast, if  
18 you look at Column M, you are increasing the Class I  
19 differential in Miami by \$1.90, correct?

20 A. That's correct.

21 Q. As compared to raising Minneapolis by \$1.30,  
22 correct?

23 A. Correct.

24 Q. Why is it that for the greatest, as you said in  
25 your testimony, the milk that needs the milk to -- the  
26 county that needs the milk to move the farthest from the  
27 farthest reserve supply, you used the average in Column O,  
28 but for Minneapolis you use a number higher than either



1 Column F or Column G or the average for Minneapolis?

2 A. We felt that the model results for Miami-Dade were  
3 adequate for the purpose of price alignment, all of the  
4 purposes we looked at for which we commissioned the model  
5 and made adjustments to it. We chose not to make  
6 adjustments to the model results for Miami-Dade. We chose  
7 to do those for Hennepin County, Minnesota.

8 Q. Wouldn't it, if we need to move milk to Florida,  
9 make more sense to increase that spread as opposed to  
10 decrease that spread?

11 A. That question would spring from a much, much  
12 simpler understanding of the whole process. And, again, I  
13 then -- then we used -- and I would recommend you direct  
14 that question to Dr. Nicholson first and -- to speak for  
15 the model, and to the person who is -- to the people who  
16 are going to testify on those two different regions for  
17 the modifications that National Milk made to the model  
18 results. They will give you much better answers to those  
19 questions.

20 Q. But we already said that Dr. Nicholson didn't  
21 calculate the average or any of these columns included in  
22 the proposal, correct?

23 A. What average are you referring to?

24 Q. Column L, University of Wisconsin didn't provide  
25 you Column L, did it?

26 A. Probably not. But they provided the two numbers  
27 that we decided to use as the starting point in the  
28 process of making further adjustments to the model



1 results. We did not necessarily use the average in all  
2 cases, but we calculated the average as a starting point.  
3 For the primary purpose that our eventual proposal had to  
4 have one number, the Class I differentials listed in the  
5 Federal Order regulations have a single number, they do  
6 not permit us to use seasonal numbers. And we saw no  
7 reason to recommend further disaggregating  
8 paragraph 1000.52 into regional -- or excuse me --  
9 seasonal -- seasonal parts.

10 Q. I want you to turn to FIPS, F-I-P-S, 80 -- I'm  
11 sorry, whoa, 08031, which is Denver, Colorado, and I will  
12 give page and line as soon as I have it.

13 The very bottom on page 4, line number 233.

14 A. Are we still just on Exhibit 301?

15 Q. Yeah, we'll stick -- unless I say otherwise -- and  
16 thank you very much. Yes. I -- let's -- I -- I think  
17 that -- I only have a very few more of these, but I think  
18 from now on we're not going to look at the fact that there  
19 was a change, we're just going to look at 301.

20 So if we look at 301, and line 233, Denver, you  
21 would agree that Columns F and G are identical at \$2.50,  
22 correct?

23 A. Correct.

24 Q. And if you look at Column I, the current  
25 differential is \$2.55. And so if you look at Column J --  
26 I'm sorry -- well, yeah, Column J or Column K, the -- it  
27 actually is down \$0.05, correct?

28 A. Correct.



1 Q. And the average in Column M is down \$0.05 on the  
2 average, correct?

3 A. That's correct.

4 Q. So how did we get from a model number that went  
5 down to 2.50 to an \$0.80 increase to \$3.30 in Column L?

6 A. As I explained, the model results were very  
7 accurate in many cases, very, very, very close. If you go  
8 through and look at those differences, you will see that  
9 they are generally pretty modest, but -- but in some  
10 cases, based upon the institutional knowledge of our --  
11 the members of our task force that were looking with  
12 expertise in those regions, we chose to make a change.  
13 And, in general, those changes were -- were relatively  
14 modest, but were not in all cases modest, and you will  
15 have to direct that question to the witness that speaks to  
16 the changes made to the Colorado numbers.

17 Q. So this allows me, I think, to ask and hopefully  
18 get an answer to a question that had puzzled me for a  
19 while until Ms. Keefe helped me understand it.

20 To the extent that a base price increase occurred  
21 from \$1.60 to 2.20, I don't see that directly reflected in  
22 MIG-29, which is 301. I believe it appears for the first  
23 time in what I think is a hard code in the Excel  
24 spreadsheet in Column O.

25 Would I be correct?

26 A. Could you repeat that question? In other words,  
27 you are asking about the \$1.60 base differential?

28 Q. No, the 2.20. I'm asking about a change -- so you



1 agree with me, you said earlier, that the model results  
2 from the University of Wisconsin, so Columns F and G, were  
3 run in each of the three iterations at \$1.60, correct?

4 A. That's my understanding, yes.

5 Q. Okay.

6 A. But you will have to confirm that with  
7 Dr. Nicholson, because we did not -- I don't recall that  
8 we -- that we decided on the 2.20 until after the model  
9 runs were made.

10 Q. And my point is, am I correct that there's no  
11 column that delineates a change in a base price from \$1.60  
12 to 2.20? There's just no column that says, here it is.

13 A. I don't see one in these documents.

14 Q. And so would I be right that the place you need to  
15 look at in order to find and maybe then backwards derive  
16 what the base price increase is would be Column O?

17 A. Column O was the final number. And I'd have to  
18 confirm that with looking at my list of these counties,  
19 cities, and parish numbers. But my understanding is that  
20 our final numbers would include the 2.20. But, yes, that  
21 would have been because it was June 2023.

22 Q. So it does, doesn't it? It must include --

23 A. Sure.

24 Q. Yes, correct?

25 A. It must include the 2.20, yes. Again, I'm seeing  
26 all these numbers for the first time in this particular  
27 spreadsheet format.

28 Q. But you, National Milk submitted it, correct?



1 A. Yes, it's labeled National Milk.

2 Q. Okay.

3 A. I have no reason to doubt that that's those  
4 numbers.

5 Q. All right. I only have two more of these for you.  
6 Let's go to FIPS code 48453, which is Travis  
7 County, Texas, also known as city of Austin. And as you  
8 say, there's a lot of pages. So I think we're on page 47  
9 for those in the room, and we're looking at line 2717,  
10 which is Travis, Texas, and I represent to you that it is  
11 Austin.

12 And if we do what we have done before exhibit --  
13 and that's MIG-29, 301 -- if we look at Column F for  
14 Travis, it was a \$4 from the run for May, 4.20 for the run  
15 for October, and back under Column L it's 4.10 for an  
16 average, correct?

17 A. That's correct.

18 Q. And before your counsel made corrections, or you  
19 made corrections with your counsel, the number under  
20 Column O for Travis County is \$4.70, correct?

21 A. It is listed as -- as such in Exhibit 301.

22 Q. And you have corrected it to 4.35, correct?

23 A. That's correct.

24 Q. Can you explain what happened between June and  
25 now, if you know?

26 A. No. I assume that -- no, I don't know. I do not  
27 know the reason for that correction. There were only two  
28 such corrections out of all of these numbers, so it's not



1 surprising that some further examination determined that  
2 further adjustments those two corrections needed to be  
3 made.

4 Q. And finally, let us turn to FIPS code 06065,  
5 Riverside, California, which is another state with a lot  
6 of counties but not as many as Texas, I think.

7 So page 4, line 191, FIPS code 6065, and we see  
8 for Column F, \$2.30, for Column G, \$2.50, correct?

9 A. Correct.

10 Q. The model average under Column L is \$2.40, and the  
11 proposal under Column O is \$3, correct?

12 A. Correct.

13 Q. Which is \$0.60 higher than the average, correct?

14 A. Correct.

15 Q. So California has a lot of milk, doesn't it?

16 A. In parts of the state, yes.

17 Q. So why is Riverside, California \$0.60 higher than  
18 the model average; Denver \$0.80 higher than the model  
19 average; and Miami, Florida, which we have heard a lot  
20 about for being the biggest deficit, the model average?

21 A. Well, your question derives from probably a  
22 somewhat too simplistic understanding of what the whole  
23 process was. But I would again direct you to direct those  
24 questions to the witnesses that are going to be testifying  
25 specifically to the changes in those regions.

26 Q. Is it too simplistic to think that Miami should  
27 have gone up the most?

28 A. Not necessarily.



1 MR. ENGLISH: Your Honor, I am going to go to a  
2 different section. I am mindful, I think, of certain  
3 travel plans. I don't know whether we need to have a  
4 conversation, and so maybe we need to confab, but my  
5 understanding is that Dr. Nicholson needs to be done --  
6 done today, and if it's --

7 THE WITNESS: Same here.

8 MR. ENGLISH: Well, okay. I will let National  
9 Milk decide. I mean, if -- I have more to go. I am more  
10 than halfway done, but not two-thirds. On the other hand,  
11 this was probably the longest section. So I just want to  
12 be courteous and try to give National Milk an opportunity  
13 to figure out what they want to do.

14 THE COURT: Ms. Hancock, are you able to talk to  
15 us now about a proposal as to how we proceed with those  
16 two witnesses?

17 MS. HANCOCK: Yes, Your Honor. We have --  
18 Dr. Vitaliano will be back next week. He does have to  
19 leave today for another commitment that he has, but  
20 Dr. Nicholson also needs to be done today, if possible,  
21 and he won't be back.

22 So I think if everybody is okay, we could put  
23 Dr. Nicholson's primary testimony on before lunch, and  
24 then after we return from lunch, have his  
25 cross-examination conducted, and then Dr. Vitaliano could  
26 pick back up next week when he returns.

27 THE COURT: Let me first ask, Dr. Vitaliano, how  
28 does that sound to you?





1 THE WITNESS: That sounds fine. I can be here  
2 until -- I have a flight at 6:15 from this airport.

3 THE COURT: So you possibly could be recalled  
4 today, but it's kind of unlikely.

5 THE WITNESS: Depend -- given the length of the  
6 cross-examination, particularly of these key witnesses, I  
7 would guess that if Dr. Nicholson goes on -- which I'm  
8 happy to yield my time to him -- he will be kept occupied  
9 until he has to leave for his flight.

10 THE COURT: You yield back to the gentleman from  
11 where?

12 THE WITNESS: Wisconsin, sorry.

13 THE COURT: That sounds the smartest. Do you  
14 agree, Ms. Hancock, just to have Dr. Vitaliano be  
15 interrupted now to be resumed next week?

16 MS. HANCOCK: I think that's fine. And further  
17 optimism, maybe that will help truncate some of his  
18 examination.

19 MR. ENGLISH: Your Honor, first of all, I'm happy  
20 to yield. I think what happens when you are the first  
21 witness, you don't know who else is going to say things.  
22 And I actually agree. I think it may very well be the  
23 case that if -- assuming Mr. Sims gets on and off, and  
24 Mr. Erba gets on and off, you know, I may have fewer  
25 questions. So I do think it would make sense.

26 Besides which, I think we have routinely in this  
27 proceeding recognized that the -- you know, the non-member  
28 witnesses, like Dr. Nicholson and others, should have some



1 priority. Not quite the same priority as dairy farmers,  
2 but I think next up.

3 So I am prepared to mark where I am. And I do  
4 promise, I really do, that if I get the answers to the  
5 questions before he gets back on, I will subtract them.  
6 All right?

7 THE COURT: If you get the answers to the  
8 questions what?

9 MR. ENGLISH: The questions that appear on  
10 pages 11 through 17 of my cross-examination, having  
11 finished 10, if I get those answers prior to his coming  
12 back on -- the reason I'm asking him is he's the National  
13 Milk witness, he's the first witness. I don't know for a  
14 fact what other people are going to say. If I get answers  
15 to questions that are otherwise posed for him, I will not  
16 duplicate him. I make that assurance for everybody.

17 THE COURT: Very good. Well, let's take a  
18 ten-minute break while everyone repositions. Is that a  
19 good idea? No? Well, yeah, that's a good idea.

20 We can at least -- if we take, what, you want a  
21 five-minute break? Can you be ready?

22 Okay. We'll take a five-minute break now. Please  
23 be back and ready to go at 11:46.

24 We go off record at 11:41.

25 (Whereupon, a break was taken.)

26 THE COURT: Let's go back on record.

27 We're back on record at 11:46 a.m.

28 Would you state and spell your name for us,



1 please?

2 THE WITNESS: My name is Charles Nicholson,  
3 C-H-A-R-L-E-S; Nicholson, N-I-C-H-O-L-S-O-N.

4 THE COURT: Thank you. I'd like to swear you in.  
5 Would you raise your right hand, please.

6 CHARLES NICHOLSON,  
7 Being first duly sworn, was examined and  
8 testified as follows:

9 THE COURT: Thank you.

10 DIRECT EXAMINATION

11 BY MS. HANCOCK:

12 Q. Good morning, Dr. Nicholson. Thank you for being  
13 here. Did you just provide your address?

14 THE COURT: I did not ask.

15 BY MS. HANCOCK:

16 Q. Sorry, for some reason I couldn't remember if you  
17 just did. Could you provide your business address,  
18 please?

19 A. My business address is 1675 Observatory Drive,  
20 Madison, Wisconsin, 53706.

21 Q. Thank you.

22 And did you prepare Exhibits 36 and 36 -- well,  
23 did you prepare Exhibits NMPF-36 and 36A in support of  
24 your testimony today?

25 A. Yes, I did.

26 Q. Okay. And is Exhibit NMPF-36, is that the full  
27 and complete written testimony that you have provided?

28 A. Yes, it is.



1 Q. And is 36A a summary that you are intending to put  
2 into the record today in support of the full testimony?

3 A. Yes, it is.

4 MS. HANCOCK: Your Honor, if we could give those  
5 Exhibit Numbers 302 for NMPF-36 and 303 for NMPF-36A?

6 THE COURT: We shall. Thank you.

7 (Exhibit Numbers 302 and 303 were marked for  
8 identification.)

9 BY MS. HANCOCK:

10 Q. Before we turn to your statements, I'm wondering  
11 if you can provide an overview of your educational  
12 background.

13 A. Okay. I have a bachelor's degree in economics and  
14 statistics from the University of California at Davis. I  
15 have a master of science degree in agricultural economics  
16 from Cornell University. And I have a Ph.D. in  
17 agricultural resource and managerial economics, also from  
18 Cornell University.

19 Q. And can you give us an overview of your  
20 professional career?

21 A. So I have, post-Ph.D., now experience going on  
22 close to 30 years. Much of it has been devoted to  
23 economic analysis of dairy industry issues, both in the  
24 United States and globally.

25 Q. And we heard yesterday about a group or a kind of  
26 a brain trust of agricultural economists.

27 Do you belong to that group as well?

28 A. Yes. So that is what is now known as the Program



1 on Dairy Markets and Policy, primarily led out of the  
2 University of Wisconsin. Prior to that, when it was based  
3 at Cornell University, it was known as the Cornell Program  
4 on Dairy Markets and Policy, and it was a group of  
5 academics who met to discuss dairy industry issues and  
6 offered an annual workshop for dairy economists and policy  
7 analysts.

8 MS. HANCOCK: And, Your Honor, at this time we  
9 would offer Dr. Nicholson as an expert in -- as a dairy  
10 economist. I should expand that for all the other areas  
11 he's testified to as well but primarily for our  
12 purposes --

13 THE COURT: I will write them all down, so go  
14 ahead and say what else. Dairy economist?

15 MS. HANCOCK: And applied economics.

16 THE COURT: Applied economics?

17 MS. HANCOCK: Or agricultural and applied  
18 economics.

19 THE COURT: And any others?

20 MS. HANCOCK: Any others you would like to be  
21 characterized as an expert for?

22 THE WITNESS: I would actually say that supply  
23 chain management would be an area of expertise.

24 THE COURT: Good.

25 Does anyone like to -- would anyone like to voir  
26 dire Dr. Nicholson about his qualifications to be accepted  
27 as an expert witness in the areas of dairy economist,  
28 applied -- no, agriculture and applied economics, and



1 supply chain management? Is there any objection to my  
2 accepting him as an expert in those three fields?

3 There is none. I accept Dr. Nicholson as an  
4 expert witness in those three areas, as a dairy economist,  
5 as an agricultural and applied economist, and as a supply  
6 chain management expert.

7 MS. HANCOCK: Thank you, Your Honor.

8 BY MS. HANCOCK:

9 Q. Dr. Nicholson, would you proceed in providing us  
10 your testimony?

11 A. Yes. Thank you very much.

12 So, Judge Clifton and personnel of AMS Dairy  
13 Programs, I am appearing before you to offer a summary --

14 Q. And I'm just going to interrupt you really quick.  
15 We have a court reporter who is taking down everything  
16 that we say, and so if you could read at a much more  
17 moderated pace, that will help ensure that she captures  
18 everything.

19 A. Thank you for that.

20 I am appearing before you to offer a summary of my  
21 written prepared statement describing in more detail the  
22 results of a recent research project that analyzed  
23 differences in the spatial values of milk in the  
24 contiguous United States, in particular the spatial  
25 differences in values at fluid milk processing plants.  
26 I'm an agricultural economist with more than 30 years of  
27 experience in the analysis of dairy markets, including the  
28 spatial evaluation of milk values.



1           Importantly, I am not here to advocate for any  
2 specific policy action, but rather to offer my insights  
3 into the spatial differences in the economic values of  
4 milk. This is a summary of research performed in  
5 collaboration with Dr. Mark Stephenson, who recently  
6 retired as the director of Dairy Policy Analysis at the  
7 University of Wisconsin, Madison, but also does not  
8 represent an official statement of the University of  
9 Wisconsin, Madison.

10           The analyses that I will report are based on  
11 spatial economic models that have a long history of  
12 development, beginning in the 1980s at Cornell University.  
13 Earlier versions of these models have provided evidence  
14 about spatial milk values for previous Federal Milk  
15 Marketing Order hearings, notably in 1998.

16           For the past 20 years, I have been the lead  
17 researcher responsible for the further development and  
18 updating of data for these detailed spatial economic  
19 models, again, in collaboration with my former Cornell and  
20 UW colleague, Dr. Mark Stephenson. Analyses based on  
21 these models have appeared in refereed academic journal  
22 articles -- a number are cited in footnotes -- and book  
23 chapters -- again, cited in footnotes -- and have been  
24 used by state government and industry groups to support  
25 investment decisions.

26           A summary of the key findings of this research is  
27 as follows:

28           1. Analysis with a detailed spatial economic



1 dairy supply chain model that accounts for all sources and  
2 uses of milk and dairy components, provides  
3 location-specific milk values consistent with the lowest  
4 possible systemwide costs, providing a competitive  
5 benchmark for those values;

6 2. The analyses suggests that there are  
7 considerable differences between the values of milk at  
8 fluid plants derived from the spatial economic modeling  
9 and the current values of Class I differentials,  
10 differences as large as \$3 per hundredweight;

11 3. These differences between current spatial  
12 economic values at fluid milk plants and current Class I  
13 differentials arise due to substantive changes over time  
14 in the locations of milk production, the composition of  
15 dairy product demand, changes in the location of demand  
16 for dairy products given regional population shifts, and  
17 the costs of transporting farm milk to plants,  
18 transporting dairy products between plant locations, and  
19 distributing products to final demand locations;

20 4. Review and adjustment of spatial values  
21 generated by the model for the purposes of revising  
22 Class I differentials are appropriate to account for local  
23 circumstances and institutional factors not included in  
24 the model analysis. Any quantitative model is, by  
25 definition, a simplification of reality, and the USDSS  
26 (U.S. Dairy Sector Simulator) does not directly represent  
27 existing commercial relationships that can be important  
28 determinations of the locations and volumes processed in





1 existing operations.

2 I would now like to move to a description of the  
3 U.S. Dairy Sector Simulator.

4 Spatial milk values are calculated using the U.S.  
5 Dairy Sector Simulator. The USDSS is a highly-detailed  
6 mathematical spatial optimization model, but at its core  
7 it solves a practical problem, how to get milk from dairy  
8 farms to plants to be processed into various dairy  
9 products, and distribute those products to consumers with  
10 the lowest cost possible. The model takes the total milk  
11 supply, plant locations, and product mix, and consumer  
12 demand as it existed for an individual month. It  
13 indicates how to move that farm milk to plants via the  
14 existing road network and distributes the finished  
15 products to consumers, also according to the road network.

16 For the U.S. dairy industry as a whole, the USDSS  
17 minimizes the systemwide cost of assembling milk at  
18 plants, making final and intermediate dairy products, and  
19 transporting them to other plants and locations of final  
20 demand. The model includes the principal cost between the  
21 farm gate and the retail locations for the consumer. The  
22 model minimizes this total cost subject to the physical  
23 constraints, such as mass balance and required product  
24 composition that we have imposed upon the system.

25 The most recent spatial milk values derive from  
26 two versions of the USDSS model: A large version with  
27 data disaggregated at the county level, 3,108 counties,  
28 and a smaller version with a few hundred multicounty



1 regions. Both the large and small models yield similar  
2 quantitative values and patterns of spatial milk prices.

3 Three, I'd like to talk about the USDSS model  
4 outputs.

5 There are two types of results that are provided  
6 by the USDSS. One is a primal solution, and the other is  
7 a dual solution. The primal solution describes the  
8 physical flows of product through the dairy supply chain  
9 network. The dual solution represents the relative  
10 monetary values of milk and dairy products at each model  
11 location.

12 An example of the primal output from the smaller  
13 USS -- USDSS model -- Figure 5 in the full written  
14 testimony -- and now if we can go to the slide that should  
15 be there -- is shown here. This shows milk assembly  
16 flows, processing locations, and distribution flows to  
17 final demand locations. The green lines represent milk  
18 assembly flows from farms to plants, whereas the orange  
19 lines represent the distribution of finished products from  
20 plants to demand locations. The plants are shown as black  
21 triangles. The size of the assembly and distribution  
22 flows are represented by the relative thickness of the  
23 lines, the green and orange lines. And the size of the  
24 plant location triangles indicates the relative volume of  
25 product processed at each plant.

26 And you will see that this figure is actually  
27 showing the milk assembly at fluid plants and packaged  
28 milk flows for May of 2021.



1           The dual solution shows the spatial value of milk  
2 or, more specifically, the marginal value of milk at a  
3 processing location for a supply location for raw milk.  
4 Thus, the dual values provide estimates of the spatial  
5 value of milk and are the key results reported for the  
6 purposes of this component of the hearing.

7           Dual values are calculated by the USDSS at all  
8 milk plant locations across the country, although our  
9 focus here is on the values for fluid milk processing  
10 plants. This price surface indicates estimated spatial  
11 values of milk for each county location in the contiguous  
12 United States, consistent with the spatial aggregation  
13 used for Class I differentials. However, the indicated  
14 spatial milk values should not be interpreted directly as  
15 Class I differentials. The values should be thought of as  
16 price relatives, that is, the difference in values across  
17 locations.

18           The Agricultural Marketing Service of USDA used  
19 results from a previous version of the USDSS model results  
20 as input into the 1998 Federal Order hearings.  
21 Differences between the model-generated relative spatial  
22 values of milk compared to those of the current Class I  
23 differentials suggest a potential need to modify Class I  
24 differentials.

25           Four, factors affecting the price relatives in the  
26 USDSS model.

27           The USDSS shows the spatial milk values at a given  
28 point in time, but it is also relevant to consider the



1 drivers of changes in these values. Three factors  
2 constitute the important causes of change in the spatial  
3 milk values, the price relatives. These factors are  
4 changes in the milk supply, demand for dairy products, and  
5 transportation costs.

6 The detailed written statement describes the  
7 substantive changes in the location of U.S. milk  
8 production during the past decade. It also documents  
9 changes in the product mix for U.S. industry and in the  
10 locations of the population. Transportation costs have  
11 changed over time due to the cost of purchase or lease of  
12 the vehicle, driver wages and benefits, and fuel costs.

13 I'd now like to discuss specific results for the  
14 spatial milk values at fluid milk plants.

15 The USDSS was simulated using both the smaller  
16 multi-county and large county-level versions with 2021  
17 data with similar quantitative results and patterns. The  
18 models are run for the months of May 2021 and October '21,  
19 to represent both the flush and the short months of the  
20 year.

21 The general pattern is lower values in the north  
22 and western regions, and rising into the south and eastern  
23 areas of the U.S. The pattern of these values mirrors the  
24 current Class I differential structure and reflects the  
25 relative surplus and deficit regions of milk. However,  
26 the current differentials range from \$1.60 to a high of  
27 \$6, while the model suggests that the price surface is  
28 steeper moving towards the Southeast, high values more



1 than \$7, reflecting both changing regional production and  
2 demand and higher transportation costs.

3 Spatial milk values for October '21 have a pattern  
4 similar to that in May 2021, but with the spatial values  
5 in the Southeast indicating an even steeper price surface  
6 and reaching a maximum value of more than \$8.

7 The seasonal differences in value, which are  
8 Figure 17 in the original full written testimony, indicate  
9 a fairly steep rise in values from St. Louis through  
10 Atlanta, and down to Miami, along the I-75 corridor. The  
11 western portions of the U.S. show very few seasonal  
12 differences in the calculated spatial values of milk.

13 The differences between the May 2021 spatial  
14 values and the current Class I differentials are  
15 considerable.

16 Let me refer, then, to the second of these  
17 figures. In particular, there's a band from about  
18 Norfolk, Virginia, through Montgomery, Alabama, where the  
19 current Class I differentials appear to be well below the  
20 model calculated spatial value of milk at the assumed  
21 \$1.60 per hundredweight minimum differential. There are  
22 also a few cities, such as Charleston, West Virginia,  
23 Cleveland, Ohio, and Chicago, where Class I differentials  
24 are considerably below USDSS model estimated spatial  
25 values.

26 The U.S. is roughly divided between east and west  
27 approximately along the Mississippi River, which separates  
28 regions where differentials are modestly low, west up to



1 about \$0.80, to areas where the difference may cause  
2 difficulties encouraging milk to move where it is needed.  
3 Probably the reason that there is a ridge where there is a  
4 northern edge in the Southeast where current differentials  
5 are significantly below calculated values is because of  
6 the changes made in 2008 to the previous 2000  
7 differentials.

8 At that time, the biggest changes, up to \$1.80 per  
9 hundredweight, were made to Florida values. More modest  
10 increases were made to Georgia and Alabama, and even less  
11 to states further north. So a similar pattern of  
12 differences exists between USDSS-calculated differentials  
13 for October '21 -- 2021 -- show that here in this  
14 figure -- and the current Class I differentials, but with  
15 somewhat smaller differences in Florida, Georgia,  
16 Tennessee, and Kentucky.

17 Okay. So my concluding comments. There have been  
18 formal studies of the spatial value of U.S. milk for about  
19 a century. However, it has been approaching three decades  
20 since nationwide spatial values of milk have been  
21 systematically evaluated using the U.S. Dairy Sector  
22 Simulator (USDSS) model. Over this time, there have been  
23 considerable changes to where milk is produced and where  
24 population growth has taken place. There have also been  
25 substantive changes to transportation costs. Milk supply,  
26 demand, and transportation costs all have an impact on the  
27 spatial value of milk.

28 The USDSS captures many aspects of these



1 fundamental determinants of values in U.S. dairy supply  
2 chains to estimate spatial milk values that can inform the  
3 setting of Class I differentials. The USDSS provides a  
4 competitive benchmark for the differences in spatial milk  
5 values, and analysis for two months in 2021 indicates  
6 value at fluid milk plants considerably different from the  
7 current Class I differentials.

8 As noted, the differentials arise from the  
9 combined effects of changes in the locations and amounts  
10 of milk supply, changes in the nature and location of  
11 dairy product demand, changes in the locations and  
12 capacities of dairy processing facilities, and changes in  
13 transportation costs.

14 The USDSS provides evidence of the need for a  
15 change in Class I differentials because it represents an  
16 economic -- a spatial economic benchmark, but other  
17 factors such as existing commercial relationships can be  
18 important determinants of spatial organization. The model  
19 results provide relevant input for differences in county  
20 values, but may need to be adjusted based on additional  
21 information about the characteristic of the particular  
22 locations.

23 Any quantitative model is, by definition, a  
24 simplification of reality, and the USDSS does not directly  
25 represent existing commercial relationships that can be  
26 important determinants of the locations and volumes  
27 processed in existing operations. In fact, a review of  
28 results from a previous version of the USDSS model was



1 used as input into an adjustment process employed by AMS  
2 to specify differentials in 1998.

3 And because I'm a weather nerd in addition to  
4 being a modeling nerd, I would like to use an analogy  
5 here. So there's an analogy here to the use of models  
6 that generate the weather forecasts familiar to all of us.  
7 The outputs of large-scale weather models are used as key  
8 inputs, but forecasters often adjust this so-called model  
9 guidance with professional judgment to arrive at a more  
10 accurate forecast for a particular locality.

11 That concludes my statement. Thank you very much.

12 Q. Thank you so much, Dr. Nicholson.

13 MS. HANCOCK: Your Honor, I just have a few direct  
14 examination questions before we turn him over for  
15 cross-examination, but because we're after noon, and I  
16 fear that Dr. Nicholson probably read that as fast as he  
17 could without getting reprimanded by us, it might be a  
18 good time for lunch, and then come back.

19 THE COURT: That sounds good. Now, I spent all my  
20 time looking at 302. And I, most of the time, found out  
21 where you were.

22 Did you also cover 303 while I was in 302?

23 MS. HANCOCK: He read 303.

24 THE WITNESS: I read 303, and 302 is the full  
25 written testimony.

26 THE COURT: Well, it was a lot more fun to be in  
27 302.

28 THE WITNESS: That's what people say about





1 economic analysis all the time.

2 MS. HANCOCK: Nope.

3 THE COURT: Very good. Let's see.

4 Agricultural Marketing Service, that sounded like  
5 a good plan, yes?

6 MR. HILL: That's fine.

7 THE COURT: All right. Great. So we'll just  
8 leave everything where it sits, we'll have lunch, and we  
9 normally take an hour. Is that still good?

10 MR. HILL: Yes.

11 THE COURT: Good. Please be back and ready to go  
12 at 1:15. We go off record at 12:11.

13 (Whereupon, a luncheon break was taken.)

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1 WEDNESDAY, OCTOBER 4, 2023 - - AFTERNOON SESSION

2 THE COURT: Let's go back on record.

3 We're back on record at 1:16 p.m.

4 Ms. Hancock.

5 MS. HANCOCK: Thank you.

6 BY MS. HANCOCK:

7 Q. Dr. Nicholson, thanks for being back here with us  
8 and providing your testimony. Just a few questions to  
9 help clarify some of the things that you have in your  
10 statement and the work that you did.

11 The USDSS model, I'm wondering if you can talk  
12 about the dual values that are -- that's utilized in  
13 that -- in that model. Maybe we can start there.

14 A. Okay. So as I indicated in a previous statement,  
15 the dual values are the things that are providing us with  
16 the spatial milk values, and in particular, that lead to  
17 the mapping of the pattern of spatial milk values across  
18 the United States.

19 And without trying to get too much into the  
20 complications, essentially what those dual values  
21 represent are, in the math of the model, we have a large  
22 number of constraints. And the constraint would be  
23 something like, if you are going to make a dairy product,  
24 you have to have a sufficient amount of milk to be able to  
25 make that dairy product based on the physical yield  
26 relationships. Okay?

27 So the dual value is essentially saying, how much  
28 would a dairy plant be willing to pay to have an



1 additional hundred pounds of milk at that plant, based on  
2 the mathematics of that particular constraint? And so it  
3 is kind of a mathematical result. But it indicates the  
4 marginal value of milk, how much more would a plant be  
5 willing to pay for milk at that location.

6 Q. And so, for example, if you had two plants that  
7 were across the street from one another, so same location  
8 essentially, and you had a cheese plant on one side and a  
9 butter nonfat dry plant on the other, how would the model  
10 take those into account to quantify that?

11 A. Okay. So in the example of a cheese plant and a  
12 fluid milk plant right across the road, the model has a  
13 fairly myopic view of what the value difference would be  
14 between those two plants. We know that the component  
15 utilization in the cheese plant, like, in terms of the  
16 butter and the protein and the other nonfat solids, would  
17 be a little bit different at the cheese plant from the  
18 fluid milk plant, but we also know that the model is  
19 really only taking into account the transportation costs  
20 between those two plants based on difference.

21 And if we, dare I say it, imagine a thought  
22 experiment as a logical outgrowth of previous  
23 conversations, we would think about the fact that if those  
24 plants are really right across the road from one another,  
25 the transportation cost difference that would be captured  
26 by our estimate of transportation costs would be really  
27 pretty small. So we would have every expectation that  
28 just looking at those values from the model, they ought to



1 be fairly similar. And that is, in fact, what we see.

2 Q. And if -- if -- if instead of being a cheese plant  
3 and a butter nonfat dry milk plant, what if it was a  
4 Class I plant and a Class III plant, would that output --  
5 would that outcome change?

6 A. No. Essentially if you have two plants  
7 essentially of any type across the road from one another,  
8 again, the model is only taking into account to estimate  
9 those marginal or dual values. Any difference in  
10 component utilization and the transportation cost  
11 difference, that will be very minimal between those two  
12 plants.

13 So, no, we would, again, not expect, regardless of  
14 the two plants that are being compared, that we would see  
15 a significant difference between those two plants in the  
16 marginal value of milk. Thank you.

17 Q. Okay. I want to talk for just a second about this  
18 model, this -- you understand that previously Class I  
19 differentials were set based on 1998 modeling that was  
20 done previously; is that right?

21 A. Modeling done in 1998 or prior to 1998, I  
22 understand was one of the inputs into the Class I  
23 differential surface that was promulgated in 2000.

24 Q. And what is your understanding about how the  
25 current model that you have deployed compares to the model  
26 that was used in 1998?

27 A. Well, there are some basic similarities in the  
28 sense that we're using the same mathematical approach to



1 try and minimize the cost systemwide of moving milk from  
2 farms to plants and to final products. But there are a  
3 number of significant refinements that have taken place  
4 since 2000 that make this model much more appropriate for  
5 today's dairy industry.

6 So some of those refinements are increasing the  
7 number of spatial locations where farms, plants, and  
8 consumers can be located. This most recent version of the  
9 model went from a number in the hundreds of multi-county  
10 aggregations for milk supply, for example, to a milk  
11 supply in every county, 3,108, a significant scaling up of  
12 the analysis.

13 Also, and perhaps more importantly, what we're  
14 looking at is a very different set of product categories  
15 that are now in the model that the 1998 model version, if  
16 I'm recalling correctly, really only had four products to  
17 represent four product classes. We now have in the tens  
18 of different product categories, and we account for a  
19 larger number of what we call intermediate products,  
20 products that flow from one dairy plant to another, such  
21 as the use of nonfat dry milk and cheese making.

22 So other refinements on this really relate to the  
23 data which we have updated. We have a very different set  
24 of population distributions, we have a very different set  
25 of dairy product demands, and we have a very different set  
26 of both farm production locations and components in farm  
27 milk than we had back in 1998.

28 So all of those things represent a major overhaul



1 to the model structure since the time it was originally  
2 used.

3 Q. And National Milk approached you, was it in 2021,  
4 to help them with some modeling work?

5 A. So my recollection is that National Milk  
6 approached Dr. Mark Stephenson in March of 2022 to ask  
7 about the possibility of us updating the USDSS model from  
8 its 2016 database to 2021.

9 Q. And how is that you got involved to take over that  
10 modeling work?

11 A. So I originally became involved in taking over the  
12 responsibility for the USDSS when I went to Cornell  
13 University in 2000. I had previously done graduate work,  
14 as I noted in the earlier session this morning. I came  
15 back to be a senior researcher at Cornell and was tasked  
16 with the job of updating the particular model that we're  
17 talking about, the USDSS.

18 So since 2000 I have been the primary programmer  
19 of the model, and the primary person who has collaborated  
20 with others to put together the datasets that we need to  
21 run the model.

22 Q. And so at some point -- so Dr. Stephenson asked if  
23 you would do the modeling work that National Milk was  
24 asking to be done because you were the one that was in  
25 charge of this database and the information?

26 A. Typically this has been a team effort between  
27 Dr. Stephenson and myself. My role has been primarily to  
28 make sure that the programming code and the model results



1 are run. I'm the guy who flips the switch on the model on  
2 a computer to make it actually generate the numbers, and  
3 I'm the one who knows how to do that.

4 We have shared responsibilities for the collection  
5 and updating of the data that the model needs to actually  
6 do its magic in a particular month of a particular year.  
7 So it's been a shared effort.

8 And so when Mark was approached as the better  
9 known of the duo doing modeling by National Milk, he would  
10 need to ask me if I'm interested in collaborating to make  
11 that happen.

12 Q. Because you are the one that's in charge of the  
13 model?

14 A. I'm the one who is in charge of the model. I'm  
15 the one who has the model on my laptop, and I'm the one  
16 that needs to flip the switch.

17 Q. And did National Milk give you any kind of  
18 directives or guidance or any kind of outcomes that they  
19 were hoping to achieve when they asked you to perform this  
20 modeling work for them?

21 A. What I recollect is, whenever somebody has asked  
22 us to do an update to the model, and this has happened on  
23 a number of occasions, they always want to know what's the  
24 latest information that you can use so that it's the most  
25 recent.

26 So we had to have a little bit of a conversation  
27 about what year. And that's why, even though we were  
28 midway into 2022 at that point, the data availability was



1 such that we could only do 2021.

2 We also have typically, as I noted in the  
3 statement this morning, used the approach of doing two  
4 months within a given year to represent more of a flush or  
5 surplus season for milk, and a fall season in which milk  
6 is in shorter supply, so that we have the contrast between  
7 those two months.

8 So we have, on occasion, used months other than  
9 the May and October that you see reported, so we had a bit  
10 of a conversation about, are May and October okay? And  
11 that seemed to be okay.

12 But other than that, it was up to us to update the  
13 data and provide some initial results to the National Milk  
14 team for discussion.

15 Q. Okay. So did they tell you, we're hoping to at  
16 least increase it by a certain amount, or here's some  
17 information that might help influence where the numbers  
18 are going to go?

19 A. No. The initial model analyses that we undertook  
20 were completely independent of any direct input from  
21 National Milk, other than the things that I have  
22 mentioned.

23 Q. Okay. And so that first time that you ran it in  
24 May of 2022, you were using 2021 data; is that right?

25 A. Yes.

26 Q. And what was the transportation -- what was the  
27 transportation costs that you were using in the initial  
28 run?





1           A.     So the transportation costs that we have in the  
2 model, what we do is create a large matrix of costs that  
3 link every origin point to every destination point in the  
4 model. To do that we use a transportation cost function  
5 that relates distance to the amount that it costs to move  
6 either a hundredweight of farm milk, or an intermediate  
7 plant product like cream, or a distribution route like  
8 packaged milk.

9           The things that are easier for us to change to  
10 make it more applicable to 2021 would be something like a  
11 fuel diesel price and a wage rate. And so we did adjust  
12 the diesel price to 2021, and we did adjust the wage rates  
13 to 2021 based on Bureau of Labor Statistics data and data  
14 from -- I think it's the U.S. Department of Energy on the  
15 fuel costs.

16          Q.     Okay. And -- and that was so that you were  
17 matching the transportation costs with the year in which  
18 you were evaluating the other data as well?

19          A.     Yeah. To be consistent, I mean, one can imagine  
20 running a scenario, we had originally did this, where we  
21 used the much higher 2022 diesel fuel prices, which would  
22 generally tend to raise the nature of that price relative  
23 surface. In part based on our assessment and in part  
24 based on conversations with the folks at National Milk, we  
25 decided it was probably better to be consistent because we  
26 had 2021 data for farm milk supplies, dairy product  
27 demands, and processing plant locations, and used 2021  
28 diesel fuel values, even though they were lower than the



1 high values that we saw in 2022.

2 Q. And did you feel like that was National Milk  
3 attempting to be fair about ensuring that the data that  
4 they were using in the model was going to be more  
5 accurately representative of the 2021 calendar year?

6 A. It struck me as being both fair and also more  
7 consistent, given that the rest of the data in the model  
8 were 2021.

9 Q. Okay. And certainly not National Milk trying to  
10 puff up its numbers, right?

11 A. I guess I don't want to speak to what National  
12 Milk's intentions were, but I can say I never had any  
13 impression that -- other than providing us with relevant  
14 input to help us do our job, that they were trying to  
15 influence the result in a particular way.

16 Q. Okay. And after running those initial results,  
17 National Milk asked you to run them again in June of that  
18 year; is that right?

19 A. That's correct.

20 Q. What additional information did National Milk  
21 provide you, or what additional guidance did National Milk  
22 provide you in order to have you re-run the numbers?

23 A. Yeah, maybe it's helpful here for me to point out  
24 that we have always tried to be folks that are more in the  
25 role of an analyst and not of an advocate. So when  
26 someone asks us to do modeling work such as this, we can  
27 have legitimate discussions about what scenarios are  
28 relevant, that is, what assumptions we will use when we're



1 going to run a model like this. And an example would be,  
2 should we use the 2021 May and October diesel price or  
3 should we use the 2022 diesel price as a way of evaluating  
4 what that price surface would be?

5 So we had conversations with them about what  
6 scenarios would be most appropriate, and one of the  
7 conversations related to the diesel price.

8 We had another conversation that was related to  
9 what we call the plant lists, which is the processing  
10 plant locations and processing capacity values that we  
11 have for plants in the model. And at that point, the  
12 National Milk team had reviewed our plant list and  
13 suggested that maybe we should not use the plants that had  
14 already closed. And so we made some minor modifications  
15 to a couple of specific plants based on the area of  
16 specific knowledge of the National Milk team in order to  
17 run an additional set of scenarios.

18 Q. And that original plant list that you had for the  
19 initial run, did -- was that something that you already  
20 had prior to National Milk?

21 A. Yes. So that plant list has been something that  
22 has been developed over a long number of years and adapted  
23 from information on various sources. And that can  
24 actually include personal contacts with people in the  
25 industry, where they will say there's going to be a plant  
26 coming online, it's going to make these products. We also  
27 have some states where there are lists of licensed plants.  
28 Like, in Wisconsin, we have a licensed dairy plant list



1 that we can look at. And we also have information that  
2 comes from public press announcements about plant closures  
3 or plant openings.

4 And so we had developed that list over a long  
5 number of years and agreed to share that list with  
6 National Milk to solicit their input on how we could make  
7 the list more accurate.

8 Q. And so National Milk, in providing you with some  
9 updated information about plants opening or closing, did  
10 you take that into account when you re-ran the model?

11 A. So we kept the results from the first of our  
12 simulations, and then through two iterations, we made  
13 adjustments based on allowing plants that were scheduled  
14 to come online to be included, so that meant we had to add  
15 those into the entire structure of the model for the  
16 analysis, and then also to sort of disallow processing of  
17 facilities that had either already been closed or slated  
18 to be closed, so we made those adjustments.

19 I don't remember the exact number, but I think  
20 we're probably talking about a total of six to eight  
21 plants switching from one category to another out of  
22 several hundred, that are across the different product  
23 categories.

24 Q. And how much did this affect the model results?

25 A. So not -- not very much. And actually, I remember  
26 remarking to Mark that we were going to have to do a lot  
27 of work to review the entire plant list when it wasn't  
28 going to make a dang bit of difference. So it can make



1 some difference if you have a very large plant in a  
2 specific location, that can be impactful.

3 We did analysis when there was a Kraft Foods plant  
4 in Canton, New York that was going to shut down and stop  
5 making cheese, and we saw that right in that localized  
6 area, yes, it actually had a fairly significant impact,  
7 like \$0.50 hundredweight, on the producer value of milk in  
8 that area, but it did not affect the overall price  
9 patterns for the United States. And the same is true for  
10 the changes that we made to either close plants, not allow  
11 them to be part of the model solution, or to allow plants  
12 to enter.

13 Q. And notwithstanding the additional work that it  
14 required from you, and even understanding that it might  
15 have nominal or no effect on the results, you understood  
16 that National Milk was just trying to get to an accurate  
17 result?

18 A. Yeah. I think -- so one of the things that  
19 happens when we do a model like this, is people often want  
20 to know why is that number \$3.50 at this particular  
21 location? And that's a difficult answer to give for this  
22 kind of modeling approach, because there are millions of  
23 pieces of information that all come together and interact  
24 to create that \$3.50 number.

25 So when National Milk team reviewed the model  
26 results, people are always trying to wonder, "In my  
27 particular area, why did you get that \$3.50?" And that  
28 leads them to say, "Well, did you have the right plants in



1 place for the analysis? And if you'd had that one open,  
2 then you shouldn't have. And if you had that one closed,  
3 then you probably should open it up."

4 And I think that was the motivation for making the  
5 plant list more up to date, even though we recognize that  
6 in the broad picture, it was not going to change the  
7 nature of the results we were going to get.

8 I think that was what motivated in part, let's  
9 make sure that you are not getting an answer for my  
10 particular part of the world that I'm familiar with that  
11 is different than what I think because you don't have the  
12 right plants.

13 And so we appreciated the fact that we could  
14 update and make more accurate the plant list, and also try  
15 to say, we still think we're getting the right numbers for  
16 the right reasons.

17 Q. And what are the major drivers of the model's dual  
18 price results?

19 A. So the model, again, has both the dual results,  
20 which have no values, and then also the primal results,  
21 which are the physical flows through the supply chain.

22 And as I noted in the statement this morning,  
23 there are some key things that are part of those millions  
24 of pieces of information that drive that. So the key  
25 things really are, where do we have milk, and what is its  
26 composition spatially throughout the United States? Where  
27 is the milk located? What's its composition? What's the  
28 composition and location of dairy product demand? What is



1 the location and processing capacities of different dairy  
2 processing facilities?

3 And what are the transportation costs that link a  
4 farm to a processing plant in terms of milk assembly, the  
5 movement -- excuse me -- of intermediate products from one  
6 dairy processing facility to another, and the  
7 transportation costs associated with distribution.

8 So all of those are part of the core database that  
9 make up the USDSS analysis, and all of those things are a  
10 part of why we get the spatial price surface that we get.

11 Q. And I think in your testimony throughout, you  
12 refer to the model results as a benchmark.

13 Why do you consider them to be a benchmark?

14 A. So the terminology that I have used is a  
15 competitive benchmark. And in this case I'm kind of  
16 drawing upon the economic idea of perfect competition  
17 where we don't -- we say, everybody is sort of equal, they  
18 are all small, they all take the same price or receive the  
19 same price from people, and that means that we're not  
20 really fully accounting for a number of institutional  
21 factors that could be relevant to refining the model  
22 results to come up with what might be a more appropriate  
23 industrywide Class I price surface.

24 So what I'm saying competitive benchmark, what I  
25 mean is, this is sort of like the lowest possible  
26 systemwide cost that we can imagine in a perfect world.  
27 Right? And so we recognize, though, that that perfect  
28 world isn't the world in which the dairy industry lives.



1 There are lots of other factors that might be important,  
2 even if this provides a basic scaffolding for thinking  
3 about what those price relatives should be.

4 Q. Okay. And we heard Dr. Vitaliano talk about  
5 some -- some -- what I would -- that he called art, or  
6 what is an overlay over the numbers that -- that come out  
7 of the benchmark.

8 Do you recall him talking about that?

9 A. Yes, I do.

10 Q. And is that the additional information that you  
11 believe would -- is -- is used or applied to the model  
12 results that come out of this model?

13 A. I guess I -- I don't know exactly what information  
14 was used in the process, not having been a part of any of  
15 the discussions of what has been called the  
16 colored-pencils sort of adjustments. All I can do is  
17 comment on the things that I think the model does not  
18 fully incorporate that might be relevant.

19 Q. Okay. And what would those be?

20 A. I think they come into maybe three categories --  
21 well, four.

22 So one is really we use average transportation  
23 costs on the basis of difference in distance between a  
24 start and an endpoint for moving milk. We do actually  
25 adjust those for local conditions in the sense of having a  
26 different fuel cost and a different wage cost. But what  
27 we don't account for, for example, is like the density of  
28 the milk supply in a particular county.





1           So I used to work at Penn State University in the  
2 top-ranked supply chain management department, and from  
3 that I know that there are counties in Pennsylvania where  
4 there are a lot of plain sect folks, Amish, who have small  
5 farms. And our model would say, all that milk is at one  
6 location in the county, and to move that county down to  
7 the next county would all be the same costs. And the  
8 reality is that if you're trying to serve that particular  
9 set of farms, the cost would probably deviate a bit from  
10 what the model would say would be the cost to move it from  
11 one county to another.

12           Another example from when I worked in California  
13 is I'm quite familiar with how traffic can be in the Los  
14 Angeles area. So our model assumes all the costs are on  
15 the basis of a distance movement, which would say there's  
16 such and such a distance going from Bakersfield to Los  
17 Angeles, and the cost would be this, but we don't account  
18 for the fact that that time cost and the driver cost  
19 associated with it could be much different. Right?

20           So those are transportation cost examples that are  
21 probably more widely relevant for places that I haven't  
22 lived and worked that the others from the National Milk  
23 team may want to speak to.

24           Second thing is that the model has no compassion  
25 about keeping plants open because there's always been a  
26 plant there. In presentations that I have given about  
27 this model previously, I like to use the example of a  
28 model being a dairy dictator, like the Vladimir Putin of



1 dairy supply chain allocations. And it would say, if you  
2 have a plant that's not in a good location, the model is  
3 not going to keep that plant operating. But for an  
4 individual company, that would probably not be an easy  
5 decision for them to make, especially in the short-term.  
6 So the model doesn't account for that existing capacity  
7 that an organization would want to keep using.

8 Another example is commercial relationships.  
9 Again, we're hardhearted, we just want to get the milk and  
10 the dairy products from the farm to the plant, and to the  
11 consumer as a low cost as possible, with the analytical  
12 approach we're using here. We don't know anything about  
13 the commercial relationships that might link a particular  
14 farm milk supply to a farm, to a plant that actually has a  
15 contractual obligation on that milk. All right? So the  
16 model is going to show more flexibility than the real  
17 world in terms of not respecting that contractual  
18 obligation.

19 And the one last thing that's kind of important  
20 that often people have maybe been a little bit confused  
21 about is we use the model to generate these price  
22 relatives to provide a base of information for Class I  
23 differentials, but the model itself is a competitive  
24 benchmark from a supply chain perspective, it does not  
25 know anything at all about Federal Orders. It does not  
26 know anything about pooling provisions, it does not know  
27 anything about current order boundaries.

28 And so one of the things that can arise -- and



1 although I was not a part of the team at Cornell that did  
2 the modeling work in 1998, my understanding was that when  
3 the folks at Dairy Programs AMS were doing their version  
4 of the adjustment process to the model results, one of the  
5 things that they were interested in understanding and  
6 making sure was okay was sort of price alignment at Order  
7 boundaries. So we don't have any Order boundaries in the  
8 model, and therefore, we could come up with price  
9 relationships in nearby space that would be perfectly fine  
10 from a model perspective, but may not be acceptable from  
11 an Order boundary or price alignment perspective.

12 So we have sort of those four things that I think  
13 are relevant for why adjustments might be necessary to the  
14 raw results from the USDSS model that include some more  
15 detailed knowledge of local transportation conditions, the  
16 existing contractual arrangements, the existing capacity  
17 in wanting to maintain open a plant that you have invested  
18 in, and the issue of price alignment across orders in  
19 particular.

20 Q. Okay. And these four areas, these are the areas  
21 that you believe would be taken into account on top of the  
22 model results which are the benchmark that you have  
23 described?

24 A. Now, again, I can't say what was taken into  
25 account in coming up with any differences between the  
26 model results and the proposal that's being put forward by  
27 National Milk. What I'm trying to do is point out that  
28 there are factors that I would consider relevant factors



1 that would mean adjustments to the model would be  
2 appropriate.

3 Q. Okay. And one of -- one of the elements that we  
4 have heard about, and maybe you will hear more about as  
5 your cross-examination continues, is what the base was  
6 that was included in your model.

7 Can you talk about that?

8 A. Yeah. Sure. So another thing that's important  
9 for me to maybe clarify is when we run this model, we get  
10 a series of price relatives, as I've said. And it's  
11 basically about how steep is the price difference, so the  
12 marginal value difference between two locations.

13 So typically what we need to do to actually  
14 convert that to something that is equivalent to what we  
15 might think of as the current Class I differential surface  
16 is we need to establish \$1.60 as the minimum. So it would  
17 be fairly typical in a model simulation run to have one  
18 location that says the marginal value of milk is zero. We  
19 don't need any more milk here. There is no additional  
20 value from having another hundredweight of milk at this  
21 location.

22 Well, we don't fully believe that the value of  
23 milk at any location is zero. And so what we do to come  
24 up with the results that have been shared in the written  
25 testimony, and parts of here in the oral testimony this  
26 morning, is if we have a value of zero, we say, to align  
27 that with the current Class I differential surface, we're  
28 going to add a value of \$1.60 per hundredweight to that



1 and every other location. So it maintains the price  
2 relatives the same, but it takes the level, the minimum  
3 level, up to the current minimum level of Class I  
4 differentials of \$1.60.

5 And that's important, in part, to be able to  
6 compare the apples to apples that you have. Our model  
7 simulation results start with \$1.60 per hundredweight, so  
8 do the Class I differential current surface, and then it  
9 makes it a lot more consistent to evaluate the differences  
10 between the spatial values of milk in our model and the  
11 current Class I differentials.

12 Q. Okay. And that's what you did here in this case?

13 A. Yes. That's what we did.

14 Q. And so for all of the different iterations that  
15 you ran, did you always use that \$1.60 base?

16 A. Yes. So we always made sure that the minimum  
17 marginal value of milk was \$1.60 throughout the entire  
18 U.S. for fluid milk plants.

19 Q. And then at some point did National Milk come to  
20 you and say, "We would like you to increase that to  
21 \$2.20"?

22 A. No. I have no idea where the \$2.20 number came  
23 from.

24 Q. Okay. So that's not something that National Milk  
25 tried to direct you to do?

26 A. They did not direct, and it did not happen, I  
27 guess.

28 Q. And we also -- and maybe along those same lines,



1 was there anything that National Milk ever told you to try  
2 and influence your results?

3 A. So I mentioned before that the only influence was  
4 really on the design of the experiments that we were going  
5 to do, these scenarios. And those were really limited to  
6 what were the months and year we were going to look at,  
7 what was the diesel price, and let's be sure that we have  
8 the appropriate plant list that is consistent with updated  
9 information. Other than that, the scenarios that we ran  
10 were entirely based on our own data.

11 Q. Is there anything that you could have done  
12 differently in any of the iterations that you ran that  
13 would have made it more accurate or more reflective of the  
14 market conditions?

15 A. I think we have about as accurate a representation  
16 as we can with the available information, and it did  
17 actually help, even though it did not change the model  
18 solutions very much at all, and created a lot of  
19 additional work on a weekend that I didn't want to do, to  
20 have the additional information to update the plant list.  
21 And so that was the source of information that we were  
22 able to tap into the knowledge of the National Milk team  
23 to be able to improve in that sense.

24 Q. And Mr. English, when we was conducting the  
25 cross-examination of Dr. Vitaliano, he looked at a change  
26 that your model had predicted, or that your model had --  
27 the model results for Miami and the increase that was --  
28 the increase that was proposed by National Milk based on



1 that model, and then as compared to Minnesota.

2 Were you in the room when he was asking those  
3 questions?

4 A. I had the pleasure of hearing that discussion.

5 Q. Is there any insight you can provide as to, if --  
6 if the Southeast is in such dire need of milk, why the  
7 results didn't come up with something even more  
8 significant?

9 A. I guess I'd make two points in that regard. One,  
10 in the testimony that I gave this morning I noted that the  
11 largest divergence between the spatial models predicted by  
12 USDSS and the current Class I differentials are not in  
13 Florida, they are north of Florida. And I also offered a  
14 suggestion that one reason for that may have been that the  
15 differentials in that part of the country were already  
16 adjusted in 2008.

17 Q. Okay.

18 A. And one other point that I make on that is we  
19 still actually do see the largest spatial values of milk  
20 in that South Florida area, up to \$8, and so there's a  
21 considerable difference between what the model is  
22 suggesting would be the spatial value of milk at that  
23 location and the current Class I differential.

24 Q. Okay.

25 A. Just not the biggest divergence at this point.

26 Q. Meaning that area specifically had already had an  
27 update since the 1998 model results.

28 A. We can't correctly analyze that with the model.



1 But in comparing the current Class I differentials to the  
2 model spatial values, we can begin to understand that that  
3 is a possible explanation for why those -- the differences  
4 are higher north of that area than they are in that area.

5 Q. And would you mind pulling up your Figure 3 from  
6 your testimony in Exhibit 303?

7 A. I can ask the -- there you go.

8 Q. Can you talk about whether this helps illustrate  
9 what you were just describing?

10 A. Yeah. This is the pattern that I talked about in  
11 the summary this morning. The darker colors there, the  
12 oranges and the reds, are the places where there is a  
13 larger divergence between the current Class I  
14 differentials and the model-generated values.

15 And so you can see in that area down in Florida,  
16 that green area, it's a little bit hard to see the scaling  
17 on this, but that kind of generally falls in the \$1.50 to  
18 \$1, maybe \$2 range. Whereas, north of that we actually  
19 get up into things that look more -- well, definitely  
20 above \$2, maybe 2.50 to 2.75. And the brightest red spot  
21 there, which I think is around Charleston, West Virginia,  
22 is the thing that I cited as the largest of the difference  
23 of \$3.

24 THE COURT: What location is that red spot?

25 THE WITNESS: I don't know if I have my geography  
26 right, but I'm thinking it's Charleston, West Virginia?

27 THE COURT: We're getting nods "yes."

28 THE WITNESS: Okay. Thank you for helping my





1 geography-challenged brain.

2 BY MS. HANCOCK:

3 Q. And when you were talking about the transportation  
4 costs that are built in to the current model, were those  
5 same transportation costs built into the model back in  
6 1998 when it was originally run?

7 A. So some of like I mentioned before, the basic  
8 structure of the model had some similarities. But I was  
9 not part of the modeling team in 1998. What I do  
10 understand is the initial version of that model had a  
11 straight line transportation function, where the cost of  
12 transportation increased linearly mile by mile.

13 One of the things that we have, I think, learned  
14 through the additional analysis of data on the  
15 transportation costs is, at least up to a certain point  
16 where you might run into an hours-of-service limitation,  
17 the costs increase with distance, but they don't increase  
18 linearly. They taper off. They increase a little bit  
19 more slowly because you have covered some fixed costs  
20 initially, right? If you do hit that hour-of-service  
21 limitation, and you've got to go another day or have  
22 another driver, then actually that could make that cost go  
23 up again, but that's not captured directly in our  
24 transportation cost analysis.

25 Q. Okay.

26 A. So there's a very big difference in terms of the  
27 data that's been used, and also the form of the  
28 relationship that determines the cost between two



1 locations.

2 Q. Okay. And back to my original question, which  
3 was, the modeling that was -- this model that was used in  
4 1998 to set differentials, that, likewise, took into  
5 account transportation costs, it's just that the  
6 methodology of how it was taken into account has become  
7 more precise with updates to the system?

8 A. Yes. Both models includes some representation of  
9 the transportation costs for farm milk assembly,  
10 interplant flows, and distribution routes. It's just that  
11 the nature of the estimation and the updating is  
12 different.

13 Q. Okay. And in this very tight-knit world in which  
14 we live in the dairy industry, you're familiar with  
15 Dr. Stephenson using the modeling in support of MIG's  
16 proposals for their differentials; is that right?

17 A. I recently became aware of the fact that  
18 Dr. Stephenson had used model results to provide input to  
19 the MIG proposal.

20 Q. And I think you said earlier that you're kind of  
21 the keeper of the model.

22 Did he have to come to you and ask you for some  
23 information?

24 A. So we have shared a lot of the information, both  
25 the inputs and the outputs, throughout the modeling  
26 process that was undertaken for National Milk.

27 In regard to this particular question, I shared  
28 information with Dr. Stephenson to allow him to confirm



1 that he had the correct values of spatial milk values from  
2 the model. I did not realize the purpose to which that  
3 information would be put.

4 Q. Okay. And what do you understand is the  
5 difference in the methodology that he's deploying as  
6 compared to what you are doing?

7 A. Well, the same model is generating the  
8 information. And what's happening, somewhat like I  
9 described, we make a calculation that makes sure we have a  
10 \$1.60 minimum Class I differential.

11 Dr. Stephenson is taking the information from the  
12 same model and using it to do some alternative  
13 calculations and for a different purpose.

14 Q. Okay. And what do you understand is the  
15 differences in how he's doing his calculation?

16 A. Okay. So what I understand is a core part of the  
17 analysis that's been submitted is to consider the  
18 model-generated differences in spatial milk values at  
19 Class III and Class I plants, without incorporating the  
20 \$1.60 differential that is included in our analyses.

21 Q. Okay. And in your opinion, is it appropriate to  
22 use a Class I and Class III comparison in order to  
23 evaluate these numbers?

24 A. So it's a perfectly fine calculation to do to look  
25 at the difference between a Class III price and a Class I  
26 price, not including what the \$1.60 differential would be.

27 Where I think I have a bit of a difference of  
28 opinion is that we have never used this model to try and



1 determine what that minimum Class I differential should  
2 be. That is, we have never used this model to try and  
3 determine whether \$1.60 is an appropriate number. And  
4 part of the reason that we have not done that is the model  
5 does not really represent the factors that underlie the  
6 justification for that \$1.60 minimum Class I differential.

7 So my assessment is, given that the model was not  
8 really designed to evaluate what the minimum differential  
9 should be because it doesn't incorporate those factors, it  
10 is probably not appropriate to use the difference between  
11 a Class III model-generated value and a Class I  
12 model-generated value to suggest what the minimum Class I  
13 differential should be.

14 Q. Okay. And then I want to take us full circle,  
15 which was all the way back to my very first question that  
16 I asked when we started, which is, now we're back to we  
17 have two plants across the street from one another. And I  
18 posed you the question early on, if you have a Class I  
19 plant and a Class III plant across the street from each  
20 other, how the model impacts the decision to go one way or  
21 the other.

22 Do you remember that?

23 A. Yes.

24 Q. And I asked you, well, if you just took those  
25 plants and you replaced them with a cheese plant and  
26 butter nonfat dry milk plant, would the results change?

27 And what was your answer?

28 A. My answer was that regardless of the plant types,



1 because of the factors that are included in the model, we  
2 would expect to see very similar differences regardless of  
3 what class plant or what product plant type that would be.  
4 So we would not expect to see large differences based on  
5 the factors that are accounted for in the model for the  
6 hypothetical situation where a cheese plant and a fluid  
7 milk plant are right across the road from each other.

8 Q. So is the point there that this model doesn't tell  
9 you one way or another which one is the bigger driver  
10 between the -- between the classes of milk?

11 A. So I guess I would say that the model is not going  
12 to accurately represent what a fluid milk plant should pay  
13 to get milk into the plant relative to what a cheese plant  
14 should pay. It's really good at describing how the  
15 differences across space exist for different fluid milk  
16 plants, but it's not designed to account for the fact --  
17 or the factors that affect what that minimum Class I  
18 differential should be.

19 Q. And your role here today, Dr. Nicholson, are you  
20 here as an advocate for National Milk's proposal or to  
21 object or oppose any other proposal?

22 A. No. So I -- you had mentioned earlier that I was  
23 a part of something called the Program on Dairy Markets  
24 and Policy, and that was a group of academic economists  
25 with an interest and focus on dairy. And one of the  
26 things that was a requirement for membership in that group  
27 was some kind of commitment to the fact that we want to  
28 play an educational role and we want to play an analytical



1 role by providing information that can help the industry  
2 to make better decisions, and that we were not to be  
3 advocates for any particular position, in part, because as  
4 you mentioned, this is a small industry. We have worked  
5 with people on all different sides of different questions.  
6 We wanted to maintain the credibility that we were a  
7 neutral, unbiased source of information.

8 So I'm here at the request of National Milk, but  
9 I'm not actually here to say I think the National Milk  
10 proposal is a wonderful idea or it's a bad idea, or MIG's  
11 proposal is good or bad. I'm here to try and help provide  
12 some insights about the spatial milk values and how they  
13 changed over time.

14 Q. And we heard Dr. Bozic here yesterday, or a few  
15 days ago, I can't remember when it was, and he said that  
16 he's going to be stopping the work that he's doing within  
17 that Program for Dairy Markets because he's leaving the  
18 academic side; is that accurate, your understanding of  
19 what's happening?

20 A. With all due respect to Marin, who I've known for  
21 a long time, that was an appropriate decision. And it's  
22 not as if we kind of are gatekeepers. We actually sort of  
23 semi-lost a number of people through retirement that go  
24 back many years in my time. Most recently we can still  
25 count a little bit on folks like Mark Stephenson and Andy  
26 Novakovic, but essentially it's down to Dr. Chris Wolf at  
27 Cornell and myself that are the ones that are trying to  
28 make that program happen.



1 Q. And that's because Dr. Stephenson is retiring as  
2 well; is that right?

3 A. Is retired.

4 Q. Okay.

5 MS. HANCOCK: I have no further questions at this  
6 time. We would make him available for cross-examination,  
7 Your Honor.

8 THE COURT: Dr. Nicholson, would you state again  
9 and spell the names of your two colleagues who still work  
10 with you in this program?

11 THE WITNESS: Okay. So there's one colleague who  
12 is definitely not retired and still working, and his name  
13 is Christopher, C-H-R-I-S-T-O-P-H-E-R, Wolf, W-O-L-F.

14 Members that are still available to us, although  
15 they have retired, are Mark Stephenson, I can spell that  
16 if you wish.

17 THE COURT: I don't need that one.

18 THE WITNESS: Okay. And Andrew Novakovic. I can  
19 spell those if you would like as well.

20 THE COURT: Yes, please.

21 THE WITNESS: Okay. I hope Andy is not listening  
22 because if I get his name wrong, it's going to be trouble  
23 for me. So Andrew, A-N-D-R-E-W, and Novakovic is  
24 N-O-V-A-K-O-V-I-C with a special Serbian accent over it.

25 THE COURT: So -- so I got N-O-V-A.

26 THE WITNESS: K-O-V-I-C, I believe. Help me out  
27 in the audience if I'm not getting it right.

28 THE COURT: N-O-V-A-K.



1 THE WITNESS: O.

2 THE COURT: V-I.

3 THE WITNESS: V-I-C.

4 THE COURT: Pronounced?

5 THE WITNESS: "Novakovich," proud Serbian  
6 heritage.

7 THE COURT: Excellent. Now, I see we already have  
8 someone else who wants to ask questions.

9 Would you identify yourself, please, sir.

10 MR. ENGLISH: Certainly, Your Honor. My name is  
11 Chip English for the Milk Innovation Group.

12 And I had a little time to get up here because you  
13 were going through some spelling of -- of names.

14 CROSS-EXAMINATION

15 BY MR. ENGLISH:

16 Q. Good afternoon, Dr. Nicholson.

17 A. Good afternoon, Chip. Mr. English, excuse me.

18 Q. So I think, although I may get corrected, I just  
19 want to have, I think, one question based upon the last  
20 line of questioning, and I'll let Dr. Stephenson speak for  
21 himself.

22 But when you talked about the data -- or the  
23 request for information, I want to be clear that my  
24 understanding is that because of proprietary information,  
25 that is to say the work you did for National Milk was  
26 proprietary, that the data that Dr. Stephenson used was  
27 not the 2021 data, but rather 2016 data for another  
28 project; is that correct?





1 A. Yes. Excuse me for that. Yes, that's correct.

2 Q. Okay. So I want to be very clear that whatever he  
3 did was not use the data that was paid for by National  
4 Milk, correct?

5 A. Correct.

6 Q. Okay. And that was important to him, correct?

7 A. Yes.

8 Q. So I am going to try very hard to shorten my  
9 cross-examination because a number of questions that I had  
10 were questions that National Milk Producers' counsel  
11 asked. And forgive me if I do duplicate, but I'm going to  
12 try hard not to.

13 A. Thank you.

14 Q. So you were not, as you said, part of the work for  
15 Federal Order reform, correct?

16 A. The 1998 effort? No.

17 Q. Yep. And in fact, just to be clear, the 1998  
18 effort was USDA's proposed rule, but it was actually based  
19 upon a report dated July 1997, correct? Do you remember?

20 A. That's the best of my knowledge, yes.

21 Q. And are you familiar with that report?

22 A. I have reviewed that report, but it has been quite  
23 some time.

24 Q. But you reviewed it, you certainly reviewed it in  
25 light of the fact that you have been, over time, updating  
26 the underlying data, correct?

27 A. Yes.

28 Q. And you couldn't update that without having looked



1 at it some time in the past, correct?

2 A. At some time in the past, yes.

3 MR. ENGLISH: So, Your Honor, one of the things I  
4 want to try to do -- and I believe I have agreement of all  
5 counsel so I got to speed it up -- but that's -- is that  
6 rather than asking him to go through in some level of  
7 detail that report, I represent the following:

8 The 1997 report, July 1997, known as RB 9709 --  
9 and why don't I make this simpler by handing you a copy.

10 THE COURT: Thank you. So that's RB, as in boy.

11 MR. ENGLISH: Yes, 9709. Entitled --

12 THE COURT: That's 97-09.

13 And then what were you going to say?

14 MR. ENGLISH: It's entitled "A Description of the  
15 Methods and Data Employed in the U.S. Dairy Sector  
16 Simulator, Version 97.3," authors: James Pratt, Phillip  
17 Bishop, Eric Erba, E-R-B-A, Andy Novakovic, whose name you  
18 just got spelled, and Mark Stephenson.

19 This study, Your Honor, is cited six times in the  
20 Federal Order Reform proposed rule. But I also specify,  
21 and let me read from preface, page ii: "Funding for this  
22 project has been provided by the U.S. Department of  
23 Agriculture through the National Institute for Livestock  
24 and Dairy Policy and through USDA's Agricultural Marketing  
25 Service Dairy Division and Federal Milk Market  
26 Administrators."

27 As -- as such -- and, by the way, it is cited,  
28 like I said, six times in the Federal Order reform, and it



1 is specifically footnoted. And within Federal Order  
2 reform it says, "We, USDA, had two partnerships, one with  
3 Cornell University and one with Texas A&M to assist us  
4 with Federal Order reform."

5 Rather than making --

6 THE COURT: To assist us with what?

7 MR. ENGLISH: "To assist us with Federal Milk  
8 Order reform."

9 I -- I believe that this is basically a public  
10 document funded by the federal government, submitted to  
11 the federal government, recognized by the federal  
12 government.

13 Rather than making it an exhibit and, you know,  
14 helping the paper companies sell more paper, I simply  
15 propose -- with a citation I'll give in a moment -- to  
16 take official notice of it. I believe I have agreement of  
17 all the parties. Maybe it will shorten my  
18 cross-examination by 30, 45 minutes.

19 THE COURT: Now, are you going to put this -- if I  
20 take official notice of it, are you going to submit it so  
21 that it's part of what USDA receives as a document, or are  
22 you just going to leave the citation in the record be  
23 adequate?

24 MR. ENGLISH: Yes. The second is the case, Your  
25 Honor.

26 THE COURT: All right.

27 MR. ENGLISH: So the citation I have is --

28 THE COURT: Just one second before you do that.



1 I want to ask if there's any objection to our  
2 proceeding in this manner?

3 There is none.

4 Thank you, Mr. English. Now you may tell me  
5 everything that you want in the record about this citation  
6 of this document of which I will take official notice.

7 MR. ENGLISH: All right. The citation is  
8 [dairymarkets.org/pubPod/pubs/RB9709.PDF](http://dairymarkets.org/pubPod/pubs/RB9709.PDF).

9 THE COURT: Great.

10 THE WITNESS: So, Mr. English, if I may? So that  
11 is an online reference through the DairyMarkets.org  
12 website, which, since Mark has retired, has been less well  
13 maintained. But that document, the RB stands for research  
14 bulletin, and it is also available perhaps in a more  
15 permanent and accessible form at the Charles H. Dyson  
16 School of Applied Economics and Management web page under  
17 research bulletins. So just in case there would be any  
18 issues with the link that would make that available, there  
19 is an alternative source.

20 MR. ENGLISH: I'm grateful. The link worked this  
21 morning.

22 THE WITNESS: Excellent.

23 MR. ENGLISH: I don't guarantee it works this  
24 afternoon.

25 THE WITNESS: I don't either.

26 THE COURT: I'd like you to spell the name that is  
27 part of the identification of where a person would find  
28 this report.



1 THE WITNESS: So this is Cornell University, the  
2 Dyson School, D-Y-S-O-N, School of Applied Economics and  
3 Management. And I imagine that a Google search of  
4 research bulletin, Cornell Dyson, would take you somewhere  
5 close to accessing it through that set of links.

6 THE COURT: Excellent. Thank you both.

7 I do take official notice of this document,  
8 R.B. 97-09, the name of the document -- well, first of  
9 all, the date of the document is July 1997 (printed  
10 December 1997). Name of the document is "A Description of  
11 the Methods and Data Employed in the U.S. Dairy Sector  
12 Simulator, Version 97.3." Down at the bottom it says "A  
13 Publication of the Cornell Program on Dairy Markets and  
14 Policy."

15 BY MR. ENGLISH:

16 Q. So now, Doctor, counsel for NMPF took you through  
17 some of the updates since that time, correct?

18 A. Yes.

19 Q. So I just want to, as quickly as we can,  
20 nonetheless, talk about the robustness subject of the  
21 updates, nonetheless so this record has the robustness of  
22 what was in there in 1997, to the best of your  
23 recollection.

24 I'm going to give you some ideas, and you can tell  
25 me whether I'm right or not. Does that work?

26 A. Yeah. Okay.

27 Q. And part of that is, and for your Honor's benefit,  
28 since this was -- you know, we had informal rulemaking for



1 Federal Order reform. That is to say Congress passed a  
2 statute that said, you know, go do all this stuff, but  
3 don't be here in this hearing room. And for whatever  
4 reason, people decided they prefer this process.

5 And so -- but this is a different process. It's a  
6 formal rulemaking, and so things that were just -- there's  
7 no -- there's no hearing record, to my knowledge, from  
8 that proceeding, but there's a hearing record here, so  
9 I -- just bear with me, and again, I'm trying to move as  
10 fast as I can.

11 THE COURT: I don't want you to go fast. I know  
12 that Dana Coale wants you to go fast.

13 MR. ENGLISH: And I think Dr. Nicholson wants me  
14 to go fast.

15 THE WITNESS: And my students, and the Department  
16 of Ag in the State of Wisconsin, but other than that,  
17 we're fine.

18 MR. HILL: Mr. English, this is Brian Hill.  
19 Before you get started, I know Your Honor wanted to have a  
20 break at some point because of the test. It's now 2:14,  
21 and so I wanted to alert you to that before we started  
22 moving.

23 THE COURT: Six minutes until we're to get FEMA's  
24 emergency system test --

25 MR. ENGLISH: Turn off all our phones.

26 THE COURT: -- this is just a test. We're  
27 supposed to have, yeah -- I'll go off record, you can move  
28 around, and see if you get it. It's supposed to go on to



1 televisions, mobile devices, and the like. It's just a  
2 test.

3 All right. Let us do go off record now at 2:14.  
4 You are free to move around. Come back by 2:25.

5 (Whereupon, a break was taken.)

6 THE COURT: We're back on record at 2:25.

7 MR. ENGLISH: Thank you, Your Honor.

8 And thank you, Mr. Hill, for reminding us about  
9 how our phones are going to blow up.

10 BY MR. ENGLISH:

11 Q. So before the break I was going to attempt to  
12 summarize with the witness some of the robustness subject  
13 to -- robustness of the 1997 materials which have been  
14 subsequently updated, some of which the most recent  
15 materials came from counsel for National Milk Producers  
16 Federation.

17 So as I understand it, there were objective  
18 functions, such as raw milk assembly costs, correct?

19 A. Are you looking at the Table of Contents?

20 Q. Yes.

21 A. Is it possible to have you guide me through that a  
22 bit?

23 Q. Yes. So I'm thinking about page -- starting on  
24 the Table of Contents, United States Dairy Sector  
25 Simulator, Explanation of Objective Function and  
26 Constraints, the fifth line down, there's a series of  
27 functions listed, and one of them is, you know, Raw Milk  
28 Assembly.



1           A.     So the -- I guess what I would like to perhaps  
2 help distinguish is the objective function is the overall  
3 set of costs for everything in the model that has a  
4 particular equation. It is not similar to the remaining  
5 ones which are constraints which must be satisfied. So --

6           Q.     I appreciate --

7           A.     -- they are all -- they are all equations, but  
8 they are of a different type when you go from the first  
9 line to the next line.

10          Q.     All right. Then in that case, help me out  
11 understanding what they are, because that's exactly what  
12 I'm having a problem with.

13          A.     Okay.

14          Q.     Just identify the reason why you are testifying  
15 and I'm not.

16                 So let's start with that. So what is a function  
17 versus a constraint?

18          A.     So a function is any mathematical relationship,  
19 and in an optimization model like the one that provides  
20 the information from the United States Dairy Sector  
21 Simulator, the objective function has got a combination of  
22 the variables in the model. And typically, in this case,  
23 it's also going to have the associated costs that go along  
24 with the variable.

25                 So, for example, a variable would be the movement  
26 of milk from one county location to a plant in a different  
27 county location. A cost associated with that would be the  
28 cost to move the milk that distance if it's a farm milk





1 assembly movement, right? So you would have a combination  
2 of a cost per unit, times a volume of milk flowing from  
3 one location to another. You multiply those two things  
4 together, and you actually get a dollar value. And then  
5 you do that about 6 million more times, and you've got the  
6 objective function for the current version of the USDSS.

7 So it's adding up the total value in terms of the  
8 costs for the month either of May or October 2021.

9 Q. And so when you said 6 million more times, that's  
10 just for the raw milk piece?

11 A. Those are all the variables that are part of the  
12 objective function, which would include the milk assembly  
13 flows, the processing at different locations, the  
14 distribution flows, the interplant flows, all those things  
15 are variables that are included.

16 It's not -- that 6 million number is not just for  
17 milk assembly.

18 Q. Okay. So that's -- the milk assembly, the  
19 receiving of milk components at plants are included?

20 A. So -- so the objective function is all in terms of  
21 values. The other functions tend to be in terms of  
22 physical quantities, because they are putting constraints  
23 on that for the most part represent a mass balance that  
24 says, if you are going to have so much cheese come out of  
25 a cheese plant, you have to have so much milk and other  
26 ingredients come into that cheese plant to be able to  
27 mathematically describe the relationship between the milk  
28 inflow and other products I mentioned already, nonfat or



1 cream, and the cheese product that comes out.

2 Most of the other of those equations that are  
3 described as the constraints are in terms of physical  
4 units. The main one that's in terms of dollars is the  
5 objective function.

6 Q. And is the restriction on use of components from  
7 intermediate products a constraint?

8 A. Yes. So that would be, for example, you can't  
9 make cheese entirely from nonfat dry milk.

10 Q. And when you talk about -- so actually, I'm going  
11 to turn to the data now.

12 So what is involved in these data and how many  
13 data points are there, if you know?

14 A. I can talk about that. Do you want me to talk  
15 about the 1997 version or talk about the --

16 Q. I'm happy -- I'm happy -- I'm happy to have you  
17 sort of --

18 A. Okay.

19 Q. -- combine. The whole point was to give people a  
20 chance to see how much was there, but I do think we want  
21 to talk about present time rather than 1997.

22 THE COURT: You are just going too fast,  
23 Mr. English.

24 MR. ENGLISH: That's because I'm not reading  
25 anymore. I will slow down.

26 THE WITNESS: Okay. So I had previously mentioned  
27 that the key data inputs in the current version of the  
28 model are the amounts of milk and their composition at



1 different supply locations, either the multi-county  
2 regions or the 3,108 individual counties, many of which in  
3 the United States will have zero milk, the locations of  
4 plants of different processing types and their capacities  
5 to the extent that we know them, and the dairy product  
6 demand at different locations based on population and per  
7 capita dairy product demand values that we have calculated  
8 based on publicly available data.

9 The other part of the information that is included  
10 in our version of the model is the transportation costs,  
11 which I have described a little bit before as being based  
12 on functions that differ for farm milk assembly and differ  
13 for interplant flows from, say of cream, from a fluid  
14 plant to an ice cream manufacturer, and for the  
15 distribution routing of final products from a plant to a  
16 customer location.

17 So if it's -- if it's helpful for me to go through  
18 and say which of the things that are listed on data here  
19 are things that are data that are included in the model, I  
20 could do that.

21 BY MR. ENGLISH:

22 Q. That would help, yes.

23 A. Okay. So cities and distances, yes, we have a  
24 network of cities, and we have the distances that connect  
25 them. It's greatly upscaled in the county level version  
26 of the current model. I have mentioned previously farm  
27 milk supply, the areas of quantity, and composition. I  
28 have mentioned previously processing locations, and



1 actually maybe if it's helpful, I can refer to the page  
2 numbers that are cited on this, if that helps those  
3 following along. Okay.

4 All right. So cities, and if we're on page iii of  
5 the Table of Contents, down at the bottom under Data, the  
6 Cities and Distances are listed on page 26 of this  
7 document. Okay. Are you with me? Okay.

8 Farm Milk Supply, Areas, Quantities, and  
9 Composition, 30.

10 Processing Locations, I have mentioned, page 34  
11 described here.

12 Intermediate Products, Description and  
13 Composition, yes, although the number and form of  
14 intermediate products was greatly expanded in the current  
15 version of the model.

16 Consumption Areas, we have demand locations.  
17 That's what I would call those consumption areas.

18 We have the Consumption of Final Dairy Products --

19 Q. Wait a minute, that was page 41.

20 A. Page 41, excuse me.

21 Consumption of Final Dairy Products, that's  
22 essentially the demand that needs to be met at different  
23 geographic locations in the United States. Here you see  
24 that's divided into two basic product categories, fluid  
25 and manufactured dairy products.

26 In the testimony, the written testimony submitted,  
27 there's a complete listing of both the final intermediate  
28 and tradable products that are included in the current



1 version of the model.

2 Dairy Product Composition, so Components in Fluid  
3 Milk Products, line 56. Okay? Components in Manufactured  
4 Products.

5 One difference that I'll note with the current  
6 version of the model is, I believe I'm correct in  
7 stating -- and I'd have to go to page 56 to be sure about  
8 it -- that fixed values were used for the composition of  
9 fluid and manufactured dairy products.

10 One of the modifications that we made -- and I  
11 recall this in part because it took a great deal of  
12 programming effort and time -- was to actually make the  
13 product composition, say, of cheese be endogenous to the  
14 ingredients that were used at the processing facility.

15 So there are a number of different ways in which  
16 you can make cheese. Not that I'm expert in that  
17 category, but I've studied enough the math of the cheese  
18 yield process, and we decided that milk coming into a  
19 plant would not be the same -- not sort of yield the same  
20 product yield as milk from another farm that had a  
21 different composition. So we expanded the role of  
22 components to account for the fact that milk with a  
23 different farm composition could result in a different  
24 product yield or require a different sort of make formula  
25 that is alternative ingredients to be used to account for  
26 an appropriate composition of a product, particularly  
27 cheese, that would be complicated mathematically in this  
28 case.



1           So I believe I'm correct in recalling that the  
2 original formulation was for fixed components, and one of  
3 the things that the updated version of the model does is  
4 allow those components to be used more appropriately to  
5 indicate the product composition when the product is  
6 manufactured.

7           Q.    If I could interrupt for one second.

8           A.    Yes, please.

9           Q.    Turn to cost data and transportation cost.  And  
10 before you go into what was, I think my understanding is  
11 that there's been a significant change since 1997 that, at  
12 some point, there was a separate transportation function  
13 created, separate function model created, that I think  
14 probably replaces all of this material about  
15 transportation; is that correct?

16          A.    So I would have to go remind myself of the  
17 specific equations that are here.

18          Q.    And I don't want to ask about the specific  
19 equations, and I think they're proprietary, and we respect  
20 that.

21                So I just -- it's my understanding that some time  
22 after 2010, USDS created a separate transportation model  
23 that is used to input into the USDS; is that correct?

24          A.    Yes.  It's different than what was used in this  
25 version of the model in 1997.

26          Q.    Okay.  And so I would rather, in this case, not  
27 talk about what was in 1997, because I think what's  
28 relevant -- because I assume that that model was then used



1 for purposes of what has been submitted for this hearing,  
2 correct?

3 A. Yes.

4 Q. Okay. And I do not, first of all, think I  
5 understand all the equations. Secondly, I don't think  
6 that they are necessarily public, and so I don't want to  
7 go into equations.

8 But if you could generally describe the broad  
9 parameters of the equations and what they cover from the  
10 separate transportation model.

11 A. Okay. So one of the things that's important that  
12 I have somewhat noted before is that this was a joint  
13 effort to develop the data sources that were used for any  
14 of the updates that we have done to the USDSS since the  
15 1997 model formulation. And that joint effort has  
16 involved both Dr. Stephenson and myself, and it may be  
17 helpful to clarify who did what.

18 So whenever we did this, we relied upon  
19 Dr. Stephenson's expertise in looking at farm milk  
20 production data and allocating that farm milk to places  
21 where the model needed to have a value appropriately in  
22 assessing the composition of the farm milk at those  
23 different locations. And Dr. Stephenson also contributed  
24 to the development of the transportation cost function,  
25 and I'll come back to that in a moment if I may. And  
26 also, Dr. Stephenson contributed the data on the  
27 processing costs for the different products at the  
28 different facilities. Okay?



1           So to come back to the transportation costs. What  
2 I understand Mark Stephenson to have done is there is a  
3 program that is available that -- actually it was an  
4 outgrowth originally of an extension related  
5 transportation calculator for milk haulers that allows one  
6 to estimate the costs of transportation, particularly for  
7 milk assembly, but also for final product distribution and  
8 for interplant flows.

9           And that cost of transportation function would  
10 take into account the core costs for a trucking company  
11 that would include overhead and maintenance and  
12 replacement of equipment. It would include some notion of  
13 the fuel costs, it would include some notion of the driver  
14 time required. And Dr. Stephenson would, in a sense,  
15 simulate the values of transportation that were required  
16 for a particular set of routes, some number of them, and  
17 then he would develop a statistical relationship that  
18 would show the cost relationship to distance travelled by  
19 that particular transportation movement.

20           And so over time, we have used that same basic  
21 approach, but to update the transportation cost functions  
22 we go back and look at new data for things like fuel costs  
23 and wages and -- and overhead and tires and things like  
24 that, that are associated with usual trucking costs. And  
25 I have to say I work a little bit in transportation  
26 logistics, but I don't know how to operate a trucking  
27 company. So I'm not sure all the things that might be  
28 included in that, but I trust Mark's judgment for that





1 particular thing.

2 Q. Do you understand that tire costs are included?

3 A. Tire costs are included. Apparently that's some  
4 kind of big deal. You blow out a lot of tires on a heavy  
5 truck and trailer unit. I see them on the road.

6 Q. So Mark was very comprehensive, correct?

7 A. I believe these are reasonably comprehensive  
8 estimates of what the transportation costs would be.

9 Q. And in fact, do you know whether for you or for  
10 Dr. Stephenson, the model -- this particular -- the  
11 transportation model, has been used to consult with  
12 members of the dairy industry to help them understand  
13 their hauling costs?

14 A. I don't know if anything like the current version  
15 of this program has been used to consult. I know that  
16 Dr. Stephenson has maintained contact with trucking  
17 companies who haul milk in Wisconsin and Minnesota. I  
18 don't know if they were providers of information or  
19 whether they were receivers of information or both.

20 I do know that a much earlier version of this was  
21 actually an extension tool that was available online to  
22 help hauling companies understand what their costs might  
23 be in part, so that they could set appropriate contractual  
24 rates to avoid going out of business. I think that was  
25 the original purpose for the tool.

26 Q. So I understand and appreciate National Milk  
27 Producers' counsel's questions to you about using 2021  
28 data.



1           How much impact does hauling cost have on the  
2 actual model results, say, the relationship between  
3 locations?

4           A.    So that's actually a little bit of a difficult  
5 question to answer, because it's fairly common for people  
6 to ask me, as I mentioned earlier, why did this change in  
7 this way? And so I can say intuitively, if we have higher  
8 transportation costs, that will tend to raise the  
9 steepness of the pricing surface.

10           But to actually say something other than like,  
11 what effect does the change in the diesel price have, and  
12 to generalize that to what effect does transportation cost  
13 have, to come up with the best answer I would actually  
14 need to go away and do two model versions where I have one  
15 set of transportation costs, so it includes all the stuff,  
16 including the tires, not just the diesel, and then run  
17 another of those, and then I can say, here's what  
18 difference this makes.

19           If it's helpful, for the purpose of this question,  
20 what we do find is that something like a diesel fuel price  
21 can have a significant impact on the steepness of the  
22 slope but does not tend to change the basic patterns that  
23 exist in the spatial milk value surface.

24           Q.    I think that was the question I was trying to ask.

25           A.    Okay.

26           Q.    It's fair to say that the current model has a lot  
27 of constraints, correct?

28           A.    Yes. I -- I can't exactly remember the number,



1 but I believe it's something like 250,000, maybe more for  
2 the bigger of the models.

3 Q. And it has a lot of variables, correct?

4 A. In the millions, yes.

5 Q. And it also has, I think, something called  
6 activities.

7 A. Activities are the synonym in linear programming  
8 world language for variables.

9 Q. Okay.

10 A. So they would include things like how much milk  
11 moves, how much milk is processed at a plant, how much  
12 product is produced at a plant, how much product is  
13 consumed at a location.

14 Q. Does the model make any assumptions about whether  
15 it is the producer or the processor who bears the hauling  
16 transportation cost?

17 A. No, it does not.

18 Q. So in terms of, say, maybe one example of what has  
19 changed over time, I think I understand from one  
20 conversation I had with somebody that -- and I don't know  
21 when it changed, but at one time, the model produced a  
22 surprising result in terms of moving milk from the west  
23 side of one of the Great Lakes to the east side.

24 Does this -- do you have a recollection about  
25 this?

26 A. I can envision this being a kind of conversation.  
27 I don't remember a specific instance that I can say, yeah,  
28 it was this location to that location.



1 Q. I think -- so, for instance, one of the -- the  
2 kinds of things you do is when you learn about that, you  
3 say -- you put a limitation in that says, you can't cross  
4 a lake without a bridge, correct?

5 A. Well, let's -- maybe I can clarify. That the  
6 current version of the model is based on the existing road  
7 network. We don't assume that the truck is going to get  
8 on a ferry and go across Lake Michigan, even though maybe  
9 in principle that's possible for some trucks. So it does  
10 rely on the existing road network.

11 And if I'm remembering correctly, there were times  
12 in past years where there was milk that could not be  
13 processed in Southern Michigan and actually ended up going  
14 into Wisconsin. So it went around the lake and through  
15 Chicago and up into Wisconsin.

16 But the -- all the movements have to be consistent  
17 with the existing road network. And so there's no kind of  
18 imaginary line that connects the city on one side of the  
19 lake with another side of the lake.

20 Q. So recognizing -- so let me go back to federal  
21 order reform.

22 Do you know that USDA itself, in Federal Order  
23 reform, took the results of the model and made  
24 adjustments? That is to say, USDA made the adjustments  
25 based upon its knowledge. Do you know that?

26 A. So I was not a part of the process of doing the  
27 modeling work that contributed to this document in 1997,  
28 and to the discussions, and I certainly was not in the



1 room, if there was a room when AMS was having  
2 conversations about this. So the knowledge that I have is  
3 secondhand knowledge that comes from the people who were  
4 involved in that process. And that's the basis for my  
5 statement that I believe there's a similarity between the  
6 use of model results and making adjustments and -- in that  
7 era and what is being done here.

8 Q. The difference being that one thing maybe -- if  
9 USDA is doing it versus private industry.

10 A. I would say that's a difference.

11 Q. So if an adjustment is made, say, to, you know,  
12 one county, and just by hypothetical, \$0.50 to the value,  
13 does that then alter the entire model because you are  
14 talking about the relative value of milk, or does it  
15 create some -- if you don't build it back in, some  
16 inconsistencies because the model would have said it  
17 should be X and now it's Y?

18 A. Again, maybe it's helpful to clarify that, again,  
19 the model doesn't know anything about Federal Orders, it  
20 only knows really about transportation costs. And also,  
21 all of the adjustments that were made, again, as I  
22 understand it in the previous 1997, 1998 process, and the  
23 adjustments that were made here, were made after the fact  
24 based on the existing model results. Okay?

25 So what we can't say with this particular model  
26 and tool is if you added \$0.50 here, is that going to mess  
27 everything up in Federal Orders, because the tool is  
28 simply not designed so address that question.



1 Q. I understand.

2 But leaving Federal Orders aside for a moment,  
3 does it impact the value in other counties if you have  
4 altered one county but not others? In the model itself,  
5 if you left out Federal Orders, would it alter the value  
6 in other counties?

7 A. The model does not allow us to actually change a  
8 value in one county arbitrarily. The model provides a  
9 result of what the value in the county would be, and it is  
10 what it is, again, based on the millions of interactions  
11 that are part of the model structure.

12 So there's no way to go in -- you can make a  
13 change to something like there's no plant there anymore,  
14 or there is a plant there, or we lost all the farms in  
15 that county, and you can evaluate what the impact of that  
16 would be in a multi-county area. But we can't actually go  
17 in and change one value and then see what happens with  
18 everything else. It's just not the way the model is  
19 designed.

20 Q. Okay. So I want to turn to your discussion with  
21 the counsel for National Milk for Canton, New York. And  
22 part of it is, I want to make sure I understand it, and  
23 then I want to understand if there is a limitation.

24 It sounds like by making a change for an  
25 individual plant, it wouldn't change the big picture. It  
26 doesn't alter the big picture as you said, that's --  
27 that -- I think that's understood; is that right?

28 A. So if you were to open or close one plant of a



1 modest or moderate size, it would not change the bigger  
2 picture.

3 Q. But would it change the localized impact? Would  
4 it have a localized impact?

5 A. So changing the availability of a plant, either  
6 bringing one online or taking one offline, can have an  
7 impact close by that plant, but it depends on a number of  
8 factors.

9 One factor would be, are there any other plants  
10 anywhere near that location? In the Canton case, that  
11 really was the only plant within a number of counties, and  
12 it was actually processing a fairly large volume of milk.

13 So if there are other plants that can take up that  
14 milk, then the impact is likely to be fairly small. And  
15 it also, as I mentioned, depends on how big a plant was  
16 that. If it was a fairly large plant, the impact would be  
17 likely to be larger; if it was a fairly small plant, then  
18 even the localized impact -- there will be some. The  
19 numbers will always be somewhat different. But in  
20 general, it takes a fairly large plant in a location where  
21 there aren't alternatives to have a significant localized  
22 impact.

23 Q. And what happens if you add a demand center in a  
24 county that doesn't otherwise already exist?

25 A. I guess we'd actually have to be creating people  
26 somehow to make that happen. But essentially we have --  
27 we have full coverage of the population of the demand for  
28 dairy products now. We could do something, and we have



1 done things like this in the past, where we say, add an  
2 export demand.

3 It's actually one of the things that's also  
4 different from the current version of the model to the  
5 previous version of the model. We actually account for  
6 the specific product exports by port district in this  
7 model, and we allow dairy product imports. The export  
8 side, of course, is much more important now than it used  
9 to be.

10 So if we had, say, a scenario where there was  
11 increased export demand, we could actually evaluate sort  
12 of the systemwide impacts of that, and we could actually  
13 do it either in a particular port location like Los  
14 Angeles, or we could do it spritzing a percentage increase  
15 across all the different port districts. And we have done  
16 some of those kinds of analysis as a part of work that we  
17 did for the state of Pennsylvania in 2017.

18 Q. So I want to go back to your answers to questions  
19 about the sort of the base.

20 A. Okay.

21 Q. How would the gradient change if the base was 2.20  
22 versus \$1.60?

23 A. So the price relatives are the same regardless of  
24 you choose \$1.60 base or 2.20 base. Because the model  
25 starts from the assumption that we have a minimum value  
26 that would be, in the case of what we have actually  
27 presented, \$1.60, and then we build the price relatives  
28 off that.





1           So on a percentage basis, maybe the slope changes,  
2 but the slope would actually be the same regardless of  
3 what the base would be. And that's kind of consistent  
4 with the idea that this model was not designed to figure  
5 out what the base should be.

6           Q.    The gradient is -- a gradient is independent of  
7 the base, correct?

8           A.    Yes.

9           Q.    Okay. So could you go back to showing Figure 3  
10 that National Milk just counsel brought up?

11           So I think maybe there was -- perhaps, on  
12 somebody's part, and it may be mine -- a misunderstanding  
13 of what I thought I was driving at with respect to the  
14 questions about Miami.

15           And I certainly understand the fact that I was  
16 there in 2007, so I know about the Southeast decision.  
17 And I know, I think, what that creates, a bit of a ridge  
18 to the north of it.

19           But Miami is green -- I know I'm -- my eyesight's  
20 not great, but Miami is in the green section, correct, of  
21 the map?

22           A.    Yes.

23           Q.    And Minneapolis is somewhat in a blue section,  
24 correct?

25           A.    Yes.

26           Q.    And blue is a smaller increase in this than green;  
27 is that correct?

28           A.    Yes. Confusingly, based on the color scheme in



1 this diagram, it's not a defined gradient, yes.

2 Q. Okay. So I think the point of my questions was  
3 what about -- well, let me start over.

4 The model suggests that the Miami price should go  
5 up more than the Minnesota price, correct?

6 A. Well, the model suggests that the difference  
7 between the model-generated spatial of milk price values  
8 in the current Class I differentials is larger in Miami  
9 than it is in Minneapolis, yes.

10 Q. And Denver is in a blue -- I think dark blue area,  
11 correct?

12 A. I actually -- I can't exactly tell. I think it's  
13 to the west of that dark blue --

14 MR. ENGLISH: Blue or purple --

15 (Excessive crosstalk.)

16 THE COURT: Which one of you would like to talk?

17 MR. ENGLISH: He would like to talk.

18 THE WITNESS: I believe that the Denver area is to  
19 the west of the blue.

20 BY MR. ENGLISH:

21 Q. So in the purple?

22 A. It's purple or some shade of purple, yeah.

23 Q. And purple's even --

24 A. Purple is a smaller value than the blue --

25 Q. Okay.

26 A. -- in this scheme of colors.

27 Q. Okay.

28 A. Which, by the way, I must give full credit to Mark



1 Stephenson for also doing the mapping.

2 Q. He'll appreciate that.

3 So that would suggest, as with Minneapolis, that  
4 the relative value spread between Denver and Miami has  
5 gotten larger, correct?

6 A. Yes. Because that is a smaller value difference  
7 there than in Miami.

8 Q. And finally, for Riverside, which I believe is  
9 also purple, it's a -- that would be the same as Denver,  
10 correct? It should be a greater spread?

11 A. Yes. Roughly approximately equal to the Denver  
12 value.

13 Q. So I would like now to have you turn to  
14 Exhibits 300 and 301.

15 A. I was hoping you would ask.

16 THE COURT: So you have those?

17 MR. ENGLISH: He has his own set, but I guess Your  
18 Honor may need a set again.

19 THE COURT: I have two sets. Does anybody need  
20 one? I do. I have two.

21 MR. ENGLISH: My briefcase is full enough. All  
22 right.

23 BY MR. ENGLISH:

24 Q. So first, as I talk about this, I have been told  
25 to stop calling them line numbers and call them row  
26 numbers.

27 So you were here, as you said with counsel for  
28 National Milk, riveted in the conversation I had with



1 Dr. Vitaliano, correct?

2 A. I was hoping you would do more line numbers, yes.

3 Q. Well, I'm actually hoping not to do any line  
4 numbers. I think I mostly want to do column numbers, or  
5 column letters.

6 A. Okay.

7 Q. Can you confirm with me -- and I'll try to shorten  
8 it -- that Columns A, B, C, D, and E are literally there  
9 because of that's how the Federal Order uses them?

10 A. Yes. Can I actually ask, though, are you  
11 referring to 300 or 301?

12 Q. For now, 300.

13 A. 300. Okay.

14 Yes. Those are reporting columns.

15 Q. Okay. And then the results of your model were  
16 Columns F and G, correct?

17 A. Yes.

18 Q. Have you ever seen, before today, columns after  
19 Column G?

20 A. Yes. So in fact, in the results that were  
21 provided to National Milk, we had Columns F, G, H, which  
22 is the October to May differences; Column I, the current  
23 differentials; Column J, May current; and Column K,  
24 October to current difference. That was information --  
25 the core information that was derived from the model were  
26 Columns F and G; the core information from the existing  
27 Class I differentials was Column I; and the others were  
28 basic calculations reporting differences.



1           So Columns F through K were things that were  
2 reported to National Milk from us.

3           Q.    Okay.  Thank you for that clarification.

4                    But after that, did -- did you do Column L?

5           A.    No.

6           Q.    Okay.  Or Column M?

7           A.    No.

8           Q.    Column N -- well, that's easy, that's just an  
9 order number.

10          A.    Yeah.

11          Q.    Basically, to your knowledge, none of the other  
12 columns after you get past Column K?

13          A.    No.  None of the other columns past Column K  
14 were -- had anything to do with the information we  
15 provided.

16          Q.    Let me specifically ask about Column R.  This is  
17 the average monthly pounds you -- have you ever seen that  
18 column before?

19          A.    So we actually do have that information in the  
20 model because we have to have -- actually, no.  Sorry.  
21 No.  Column R is not something that we reported, because  
22 we only have monthly information on pounds of milk for the  
23 months of May and October 2021.  So we -- and I also do  
24 not believe that we provided that information on the milk  
25 pounds for those two months to National Milk.  So Column R  
26 is something different.

27          Q.    Okay.  So do you have with you, or can you make  
28 available if National Milk permits, what you gave National



1 Milk so the record can have that?

2 A. So I actually was checking my computer to see what  
3 I did and did not have. It turns out that the model can  
4 run on a laptop, but actually runs on a University of  
5 Wisconsin laptop that has more bandwidth, and most of the  
6 files that are associated with that are on that laptop and  
7 not on this one.

8 So the question of whether or not it can be made  
9 available, I suppose, is up to discussion by the National  
10 Milk team since they had sponsored this particular  
11 research.

12 Q. I only asked -- just -- this is not for you, this  
13 is for the record. In terms of the foundational piece, I  
14 just -- it seems to me it would help for foundation, but I  
15 leave that to National Milk.

16 A. May I also add, though, that I don't have any  
17 reason to doubt that the information that's here is what  
18 was provided.

19 Q. And that's fine. Thank you. I appreciate that.

20 And I think -- I think I got an answer from  
21 National Milk, but -- and maybe there was also a question;  
22 I may have missed it from counsel. I don't believe that  
23 National Milk consulted with you about your columns in  
24 terms of any modifications that they proposed, correct?

25 A. No.

26 Q. Okay. Are there any areas from your model results  
27 that indicated -- apparently one of us had a double  
28 negative or something.



1 THE COURT: What -- it was unclear exactly what  
2 you just established.

3 MR. ENGLISH: So that's two people who advised me  
4 of that. Obviously it was.

5 BY MR. ENGLISH:

6 Q. National Milk Producers Federation did not consult  
7 with you about any of their modifications, correct?

8 A. That is correct. They did not consult with either  
9 me or Mark Stephenson about any of their modifications.

10 Q. Are there any areas, any counties for your model,  
11 that indicated using the \$1.60 base, the Class I values  
12 would decrease rather than increase?

13 A. Yes.

14 Q. Hasn't production grown faster than milk  
15 requirements for Class I in a number of areas?

16 A. Can I ask you to repeat that? Sorry.

17 Q. Hasn't milk production grown faster than the  
18 requirements for Class I in a number of areas?

19 A. That may be true, but I guess I don't have data  
20 before me to help establish that.

21 Q. Would -- would a value at a \$1.60 that is lower  
22 than the present suggest that at least as to that  
23 location, production has grown faster than the  
24 requirements for Class I?

25 A. So if we're looking at -- let me again, maybe make  
26 a little bit more of a lengthy explanation of this.

27 So what determines the values at a particular  
28 location, I have previously said is somewhat difficult to



1 assess because it relies on not just the values at that  
2 particular location, but also the system values, which,  
3 again, involves these millions of points of data.

4 So the factors that influence whether that value  
5 would go up or down or be higher or lower than the current  
6 Class I differentials do depend on the local milk supply  
7 and demand balance at that location, but they also do  
8 depend on the interaction of all of the other connections  
9 within the modeling structure.

10 So I guess I would say it's maybe a little bit  
11 oversimplistic to say, well, if it went down by a nickel,  
12 that must mean that there was more than enough milk  
13 available at that location, because it depends on the  
14 systemwide impacts to really be able to say that. And as  
15 I indicated before, highlighting the change at any one  
16 location is actually pretty difficult given that it's part  
17 of this broader system set of outcomes.

18 Q. Thank you for that correction/clarification.

19 A. Trying not to be too much of a lecturing  
20 professor.

21 Q. So could you put Figure 3 back up again? That was  
22 fast.

23 So given what you see there in the purple sections  
24 in the central part of the country, does that at least  
25 suggest that, say from the Great Plains from the north to  
26 south, at least until you get to Central Or East Texas,  
27 that the value for milk in Class I relative to other  
28 locations has gone down?





1 A. I'm sorry, can you maybe parse that question out  
2 into the different components for me again?

3 Q. So going back to Colorado for a moment.

4 A. Okay.

5 Q. Relative to places to the east where you see the  
6 green, I think what we're talking about -- you know, for  
7 Miami would apply also, say, comparing to, say, where we  
8 are today in Indiana, that the value -- the relative value  
9 of milk used in Class I has gone up more in Indiana than  
10 in Colorado, correct?

11 A. Again, the difference in the spatial milk values  
12 between the model and the Class I differentials, yes, is  
13 larger in Indiana than in that part of the country. And  
14 maybe it also helps, I like to think about this as having  
15 the slope is now steeper, right?

16 Q. The slope is steeper --

17 A. The slope is steeper in the model than it is in  
18 the Class I price surface as we have it today.

19 Q. It is steeper moving west to east.

20 A. Yes. I guess either way, it depends whether you  
21 are going up slope or down slope. But, yes.

22 Q. Steeper up?

23 A. Steeper up.

24 Q. You agree with me that prices in the -- that  
25 values in the fall are generally going to be higher than  
26 the spring, correct?

27 A. So we actually report a seasonal price difference,  
28 I think it's in the column here on H on Exhibit 300, and



1 we also have a mapping of that in the full report. It's  
2 at testimony. And, yes, that generally is the pattern,  
3 although there can be exceptions where there is no change.  
4 And I believe there may be a couple of places where there  
5 is a decrease in between October compared to May, but  
6 generally the pattern is higher values in October.

7 Q. So recognizing the model doesn't know what Federal  
8 Orders exist, nonetheless, this is likely to be used in  
9 some way for Federal Orders, correct?

10 A. I guess I have no idea whether this will be used  
11 or not. I guess I kind of like to think there's some  
12 input that's valuable.

13 Q. If we set prices based upon the fall run when  
14 values are generally higher than the spring, given the  
15 fact there's a minimum pricing system, would that suggest  
16 that we result in pricing being too high during the spring  
17 flush?

18 A. I guess we can't really conclude that on the basis  
19 of the model analysis, because the model does not know  
20 about Federal Orders.

21 And I will remark here that about five years ago  
22 we recognized that one of the limitations of a tool like  
23 this is that it's primarily got a supply chain value  
24 focus, and so it does not allow us to examine the  
25 implications of making changes to the Class I differential  
26 surface in terms of what that would mean in terms of blend  
27 prices or supply responses or demand responses.

28 And so with some fairly minimal support from AMS,



1 we actually began working on an alternative to that that  
2 would allow for more of that responsiveness, in essence,  
3 to develop a model that would allow me to give you a  
4 better model-based answer to your question about, is this  
5 kind of change too high?

6 But we actually can't do it on the basis of the  
7 analysis that we have here, because it relies on  
8 understanding the impacts of that change, and this model  
9 is just reporting what is, not what would happen.

10 Q. Since this is a minimum price, since the Federal  
11 Order system is a minimum pricing system, do you have a  
12 view about using the minimum over the average or the high  
13 value from your model?

14 A. I don't have a recommendation to make in that  
15 regard, because I think I -- as I mentioned, this model  
16 doesn't allow us to think through from a research  
17 perspective what the implications of using one of those  
18 values versus another would be, because it doesn't include  
19 the regulation structure under orders.

20 Q. So how is organic milk accounted for in the model?

21 A. It's included in the total milk supply, and it's  
22 not treated any differently than the conventional milk  
23 supply.

24 Q. Would you expect -- I understand it's included  
25 that way, but if it were separated out, would you expect a  
26 different result for organic milk?

27 A. So what I know of the distribution network for  
28 organic milk and its processing differences from



1 conventional milk are that it tends to move longer  
2 distances, because there are smaller processing volumes  
3 and smaller shipments going into individual stores. That  
4 would tend to suggest that there would be a higher supply  
5 chain cost for that distribution network, but I haven't  
6 done any work to analyze what that difference would  
7 actually be.

8 Q. And following up on -- on some of the questions  
9 from National Milk, would you agree that any model has  
10 inherent limitations?

11 A. Yes.

12 Q. Can this model tend to reinforce current market  
13 conditions?

14 A. So I'm not sure this model has a lot to say about  
15 whether it reinforces current marketing conditions or not.  
16 Because as -- again, as I mentioned, it's not actually  
17 modeling a market, it's modeling the logistics of milk  
18 assembly and distribution. So it's providing what I think  
19 of, again, as a competitive benchmark for the costing  
20 structures.

21 And it -- again, it -- it knows something about  
22 what milk goes into what plant. The only place that it  
23 really recognizes a class distinction is really through  
24 the addition of the 1.60 minimum value that's applied to  
25 Class I milk. Otherwise, it doesn't really know or  
26 doesn't really care where the milk is being used or what  
27 the current market structure is or whether some product  
28 was at a Class IV plant or Class III plant.



1 Q. And as you have stated to me and also to counsel  
2 for National Milk, the model doesn't consider the  
3 existence of Federal Milk Marketing Orders, correct?

4 A. That's correct.

5 Q. And so it doesn't consider depooling or  
6 performance standards or PPDs or anything like that,  
7 correct?

8 A. It does not.

9 Q. So would it be fair to say that the USDSS is more  
10 like a traffic cop but not a driver of the cars? Sort of  
11 reports on what's going on, but it doesn't actually drive  
12 the cars?

13 A. So the USDSS takes existing market conditions and  
14 provides us with an assessment of what the spatial milk  
15 value surface would look like. And in economics, we can  
16 talk about different kinds of models where a key  
17 distinction is whether or not the model has a behavioral  
18 component, right?

19 And by that I mean people will base their  
20 decisions or the behaviors on the outputs of the model.  
21 In this case, this is a pure, let's minimize costs  
22 throughout the system. I described it earlier as being an  
23 impassioned -- or a dispassionate dairy dictator that did  
24 not care about where a plant was currently located, it  
25 wants to get the lowest overall costs.

26 In that sense, this is not a behavioral model,  
27 because the only behavior that's being represented here is  
28 that ruthless cost reduction idea. So it doesn't include



1 the responses of any potential dairy producer or dairy  
2 processing facility or dairy consumer to the imposition of  
3 these Class I differentials. But we actually don't have  
4 any model that would allow us to analyze those questions  
5 at this point, which is the reason that we began working  
6 on an alternative several years ago.

7 Q. So I want to go back to your very last  
8 statement -- your last sentence in your statement, which  
9 sort of used an analogy to weather forecasting.

10 Do you remember that?

11 A. I absolutely do.

12 Q. And you reference sort of like the national  
13 weather forecast, and then there's the local forecasters,  
14 correct?

15 A. Yes.

16 Q. You are a fully neutral expert applying this  
17 model, correct?

18 A. Yes.

19 Q. And in the case of local weathermen, they don't  
20 have a financial stake in whether or not it rains or the  
21 sun shines, do they?

22 A. I guess it depends on whether they have invested  
23 in solar panels or something like that, but generally I  
24 would say, no, they do not.

25 MR. ENGLISH: Thank you. That's all I have.

26 THE COURT: Well done, Mr. English. Thank you.

27 Do we need five minutes to stretch before the next  
28 cross-examiner comes forward?



1 MS. TAYLOR: Yes.

2 THE COURT: Yes. Okay. Please be back and ready  
3 to go at 3:22. We go off record at 3:16.

4 (Whereupon, a break was taken.)

5 THE COURT: Let's go back on record.

6 We're back on record at 3:26.

7 Who next has questions for Dr. Nicholson?

8 Mr. Miltner.

9 CROSS-EXAMINATION

10 BY MR. MILTNER:

11 Q. Good afternoon, Dr. Nicholson.

12 A. Good afternoon.

13 Q. This is a change. My name is Ryan Miltner. I  
14 represent Select Milk Producers.

15 So I want to start by perhaps exposing my  
16 ignorance. You noted that the model does not, you said,  
17 doesn't recognize Federal Orders or it doesn't take into  
18 account Federal Orders; is that correct?

19 A. It does not take into account the full set of  
20 regulations under Federal Milk Marketing Orders. It does  
21 address different class plants as a part of calculating  
22 what a spatial price surface would be, but it doesn't  
23 represent the full range of incentives that would be  
24 available to dairy farmers, dairy co-ops, dairy  
25 processors, or consumers.

26 Q. That's helpful.

27 When the model attempts to create or determine the  
28 spatial value of milk, is it looking to determine the



1 value of that milk to a plant that is purchasing it or the  
2 value received by the producer who might or might not be  
3 pooled on a Federal Order?

4 A. I guess I'd say the model is not really  
5 representing either of those things. What it's looking at  
6 is what I call the price relatives: The margin, the  
7 differences in marginal value, the value of an additional  
8 hundred pounds of milk at a location. So it's not, for  
9 example, representing the pay price that a producer would  
10 get or the payment that a Class I plant would make. It's  
11 only looking at based on essentially the supply chain and  
12 logistics costs that are relevant there what the  
13 differences are in spatial values of milk.

14 Q. So for that additional hundred pounds of milk,  
15 when it's -- when it's determining that value -- and I  
16 hope I'm -- we're not ships passing in the night or  
17 whatever -- but is it -- the value that is determined,  
18 whose -- whose value is determined?

19 A. Yes, I come back. It's no one's specific value  
20 because it's a marginal value of having an additional  
21 hundred pounds of milk at that plant at that time.

22 Q. Okay. I'd like to ask about the \$1.60 base.  
23 And do you still have a copy of Exhibit 300 with  
24 you?

25 A. Yes, I do.

26 Q. Excellent. I brought my copy as well.

27 So this is Row 518, Ada County, Idaho.

28 Which one is Ada -- that's where you live --





1 that's where Ms. Hancock lives, so --

2 A. Must be an excellent location.

3 Q. I'm sure it is.

4 When I look at the row for Ada County, Idaho, I  
5 see as I look down Column F, that the May '21 model  
6 returned \$1.70 as its output, and then October '21  
7 returned \$1.60 as its output.

8 Aside from the fact that that -- that's a bit of  
9 the inverse that the fall would usually be a higher value  
10 than the spring, does that reflect that that value for Ada  
11 County in October was no higher than the base value?

12 A. So -- yes. So the \$1.60 implies that that is the  
13 value with the addition of \$1.60 to the original model  
14 result.

15 Q. Okay. Granted there's over 3,000 rows to look at,  
16 and I suppose I could have done some sort of sort function  
17 too, but I did not see \$1.60 show up anywhere else in  
18 either of May '21 or October '21.

19 Do you happen to recall if there was another  
20 instance where \$1.60 appeared?

21 A. So I have to admit that I don't recall of the  
22 3,108 different values that we're looking at in two  
23 months, so over 6,000 values, but perhaps I can shed a  
24 little bit of the intuition of what is happening there.

25 Q. Great.

26 A. So that October value for Ada is suggesting that  
27 at that month, at that county location, the model was  
28 saying there is no positive marginal value for milk in



1 that month at that location. That is, nobody would want  
2 to pay to have an additional hundred pounds of milk at  
3 that location in that month, right?

4 So that is the raw output of the model that would  
5 be used to adjust to the current Class I differential  
6 surface by adding \$1.60. So essentially the model says  
7 that value for us at that month is zero. To make it  
8 consistent with the minimum current pricing system so that  
9 we can compare apples to apples throughout the spatial  
10 analysis, that value is set to 1.60.

11 I don't know if there are other values for May  
12 that are equivalent to 1.70, but what that's suggesting is  
13 that the value of an additional hundredweight of milk at  
14 that location in May was \$0.10. Somebody would be willing  
15 to pay only \$0.10 to have an additional hundred pounds of  
16 milk at that location at that time. And then we added the  
17 1.60 to get to 1.70.

18 THE COURT: Mr. Miltner, may I ask probably an  
19 ignorant question, but I -- I am just puzzled. When an  
20 area is not regulated, where do you get your inputs for  
21 the model?

22 THE WITNESS: So you are saying that to me?

23 THE COURT: Yes.

24 THE WITNESS: Okay. So, again, the model does not  
25 rely on information about whether an area is regulated or  
26 not regulated, it only relies on the core data of the milk  
27 supplies and composition, the population and the demand  
28 for dairy products, the plant locations and their



1 capacity, and the transportation network that connects  
2 them.

3 So the model itself is not trying to capture the  
4 current full regulation, it's trying to represent a  
5 competitive cost benchmark in the absence of regulation.

6 THE COURT: Is milk composition readily available  
7 online for an unregulated area?

8 THE WITNESS: So much of the milk composition  
9 information comes from state-level national statistics  
10 offices. They -- for major dairy states, they tend to  
11 report more information than for states that are not major  
12 dairy states. For some states what we need to do is use a  
13 statistical relationship that compares the butterfat value  
14 to the other components in the milk because that  
15 information is not reported. Information is also  
16 sometimes reported through the Federal Milk Marketing  
17 Order statistics for things like milk composition that we  
18 can also use to develop the composition at different  
19 locations, whether they are regulated or not.

20 THE COURT: Thank you very much.

21 THE WITNESS: Thank you.

22 MR. MILTNER: Changing gears a little bit.

23 BY MR. MILTNER:

24 Q. Mr. English asked you about the relative values of  
25 milk in Colorado and here in Indiana.

26 Do you recall that questioning he asked of you?

27 A. Yes.

28 Q. Okay. I understand that the model when making --



1 if you are comparing those two locations, what the model  
2 shows is that the change in the incremental value of milk  
3 in Colorado is a lower magnitude than the change in the  
4 incremental hundredweight in Indiana.

5 A. Again, I think I would be careful about using  
6 change so much as saying there is a divergence between the  
7 current Class I value at that location that is bigger in  
8 Indiana than it is in Colorado. So -- because we're not  
9 actually making a change in the values, we're just looking  
10 at the fact that there is a difference between those  
11 values and those locations and the size of the difference  
12 is different.

13 Q. And so it's not that the -- it's not that the  
14 value -- I'm not going to get my terms right. It's not  
15 that the value of milk in Colorado has declined since  
16 1998, it's that the rate or the magnitude of the  
17 difference between the measurement in '98 and the  
18 measurement in '21 is smaller in magnitude than the same  
19 measurements for Indiana?

20 A. Again, so if we take the current Class I  
21 differential surfaces representing 1998, but actually we  
22 should also probably incorporate the changes that were  
23 made in 2008. That's why I want to be a bit careful about  
24 this.

25 What it's saying is that the divergence has become  
26 bigger in a place like where we are here in Indiana than  
27 it became in -- in that supply location in Colorado for  
28 that plant location in Colorado.



1 Q. Much more articulately stated than I tried to.

2 A. I'm trying.

3 Q. Okay. Do you have a copy of your testimony as you  
4 presented it, NMPF-36A?

5 A. Yes, I do.

6 Q. Great. I'm looking at Figure 1 there. And so I'm  
7 looking at the state of New Mexico, and you have got a  
8 plant there in Albuquerque. And, again, the yellow lines  
9 show the flows of the product from the plant to the  
10 consumer, correct?

11 A. That's correct.

12 Q. Okay. Now, I note that for that plant in  
13 Albuquerque, as least as it's presented here, there are no  
14 green lines.

15 Can you explain how -- how milk inflows to plants  
16 are represented on here?

17 A. Okay. So the absence of a green inflow line of  
18 that Albuquerque location is indicating that the milk that  
19 went into that plant originated at that same location. So  
20 one of the things that's important to note about this  
21 particular figure is that the mapping is based on the  
22 smaller model configuration that did not have -- it had  
23 multiple counties aggregated into one supply location,  
24 like at Albuquerque, and therefore, it doesn't pick up the  
25 full disaggregated information that would be all of the  
26 counties which would actually definitely show a green line  
27 if that was going to be a supply plant that was  
28 distributing to those other locations.



1           And the reason to use this small model version  
2 rather than the big model version, is if you have 3,108  
3 different lines going to every consumption point in the  
4 United States, you basically can't discern any reasonable  
5 patterns with that information.

6           So this is trying to represent the kind of  
7 information that is provided by the model, but there's a  
8 much more detailed distribution routing that would be  
9 present in the full 3,108-county model that's not shown  
10 here because it's just too messy.

11          Q.    So, for example, in as -- if the milk supplies in  
12 Albuquerque and Bernalillo County had -- had declined as  
13 farms had gone out of business and milk was being pulled  
14 from the Roswell area in Eastern New Mexico, those  
15 counties could be aggregated under -- under the model as  
16 it was used to create this map, and it wouldn't show that  
17 milk movement across the state graphically?

18          A.    Yes, that's correct. So it's not going to show  
19 the movements of milk that would come from anything other  
20 than the multi-county region that's represented here.

21          Q.    And the same would be true for the plants in El  
22 Paso there, correct?

23          A.    Yeah. A similar situation applies there, though  
24 I'm -- I think there may be a green line underneath that  
25 that's may be coming from Las Cruces going down to El  
26 Paso.

27          Q.    There could be.

28          A.    I can't tell. Yes.



1 Q. Okay. Now, New Mexico is the ninth largest state  
2 in dairy production, and they have lost production that's  
3 down about 10% year over year in '23.

4 So that loss of production, since it occurred  
5 since this model was run, wouldn't be incorporated into  
6 the model, correct?

7 A. That's correct, because the model is based on 2021  
8 data.

9 Q. Time still flies. I mean, from -- because it's a  
10 spatial model, if -- if a significant milk shed had a  
11 decline of 10% of its milk supply, would that -- do you  
12 think that would have a meaningful effect on the output?

13 A. So it could have a meaningful effect on the  
14 output. It does depend on the -- as you mentioned, the  
15 percentage decrease, the magnitude of that, but also what  
16 the base was that we started from. So I don't know what  
17 the milk production is in Rhode Island, but if we lose  
18 100% of it, it doesn't make any difference to anybody.

19 Q. Right.

20 A. So to give you a better answer to the question, we  
21 would actually have to look at that magnitude of milk  
22 production reduction, preferably in the full county model  
23 to have the better spatial disaggregation, and we can  
24 assess what the impact would be. In general, we would  
25 expect that the marginal value of milk in that region  
26 would be lower, sorry, might be higher with the lack of  
27 milk that's available from that location.

28 Q. Mr. English did a fine job of eliminating lots of



1 my questions. Actually, I think he's done a fine job of  
2 getting rid of the rest of my questions, so I don't have  
3 anything further.

4 MR. MILTNER: Thank you very much, Dr. Nicholson.

5 THE WITNESS: Thank you.

6 THE COURT: Mr. English?

7 CROSS-EXAMINATION

8 BY MR. ENGLISH:

9 Q. So a bit of a follow-up, and from what Mr. Miltner  
10 just asked, I'm not sure if we need to bring the map up or  
11 not.

12 How big are the multi-county regions?

13 A. They vary depending on the state location. I  
14 actually wonder if there is -- yeah. So I do have in  
15 97-09, R.B. 97-09, these have been modified somewhat for  
16 the small version of the model, but you get the basic idea  
17 that we have denser representation.

18 Q. Sorry, what page are you looking at?

19 A. Sorry, 32, and thank you for asking me about that.

20 MR. HILL: What exhibit?

21 MR. ENGLISH: This is not an exhibit. This is the  
22 official notice document.

23 THE WITNESS: Yeah. This is not the exact replica  
24 of the multi-county regions that are present in the small  
25 version of the model, but it indicates that areas where we  
26 have a greater proportion of the milk supply, at least at  
27 that time, received smaller aggregations of counties into  
28 the multiple-county region.





1 BY MR. ENGLISH:

2 Q. So that's, of course, back in 1997.

3 What are the multi-county regions now?

4 A. Well, they are similar to this, but I can't tell  
5 you just by looking at this what the differences are  
6 between the current version of the multi-county, what we  
7 call the small model, and the county-level analysis.

8 Q. But we know, of course, it has definitely shifted  
9 west, correct?

10 A. Yes. So the dots that are represented on that  
11 Figure 6 do indicate the locations and the relative  
12 magnitudes of the milk supplies in those multiple-county  
13 regions.

14 So for example, if you look at the Central Valley  
15 of California, it's nearly every county has its own  
16 representation. And each of those dots is large. There's  
17 a somewhat similar story in Wisconsin, and there's a  
18 similar story in New York.

19 So the principle that's being applied here is the  
20 same. I can't tell you without actually doing further  
21 checking what the differences are.

22 Q. So just to be clear, we don't have in the record  
23 what the multiple-county supply areas are in 2021 for the  
24 purpose of the model?

25 A. For the small version of the model, we do not.

26 Q. Okay. I'm sorry. I may have missed something.

27 Is there a large version of the model that we do  
28 have it for?



1 A. Yes. Actually in my -- well, we don't have a  
2 map -- well, we do not have, I think in the record, a map  
3 that shows the county-level milk supplies in a way similar  
4 to that Figure 6 on page 32 of this document. We also  
5 don't have the similar version for the multi-county  
6 regions for the updated version of the model.

7 All I was trying to do by showing you that figure  
8 is to illustrate the basic idea that back in 1997 we  
9 couldn't solve a model that was bigger than this, and it  
10 was a challenge at the time. It required actually like  
11 mainframe computing. And so the multiple-county regions  
12 were put together to allow the problem to be tractable, to  
13 be solved, to provide information.

14 Q. So how many -- there were 240 multiple-county  
15 supply areas back in 1997.

16 How many are there today, do you know?

17 A. I don't know off the top of my head.

18 MR. ENGLISH: Thank you, sir.

19 THE WITNESS: Thank you.

20 CROSS-EXAMINATION

21 BY MR. MILTNER:

22 Q. Just to quickly follow up on that. The  
23 calculations that are really the output that National Milk  
24 has utilized, that was based on an analysis of all  
25 counties, right? The aggregation of counties was really  
26 limited to providing that figure showing flows of milk; is  
27 that correct?

28 A. That's correct. Although I would note that the



1 differences between the analyses, we actually ran the  
2 smaller model first because we had difficulties getting  
3 the larger model to solve because of its extended size.  
4 But we also recognize that it's a lot easier graphically  
5 to show the flows from that model, even if it loses some  
6 of the spatial detail.

7 I'd also -- I guess I would say that the flows are  
8 there more to illustrate the kinds of outputs from the  
9 primal side of the model than to be a focal point for what  
10 the marginal values of milk would be.

11 MR. MILTNER: Thank you.

12 THE WITNESS: Thanks.

13 THE COURT: Mr. Rosenbaum.

14 CROSS-EXAMINATION

15 BY MR. ROSENBAUM:

16 Q. Steve Rosenbaum, International Dairy Foods  
17 Association.

18 So you described the map as establishing, if you  
19 will, the value of marginal milk at a particular location,  
20 correct?

21 A. It's the marginal value of milk at a particular  
22 location.

23 Q. But, obviously, for these purposes, we're  
24 considering whether to what extent to use these for  
25 purposes of setting Class I differentials, correct?

26 A. That's my understanding.

27 Q. So that at that point, they become an actual  
28 payment obligation by processors, correct?



1 A. Well, so --

2 Q. Differentials --

3 A. -- the -- let me be clear. The model is  
4 generating spatial milk values at a differential surface.  
5 Whether that is used to create a system that results in  
6 processor obligations is not -- that's not part of what I  
7 have analyzed. It's -- it's not part of what the model is  
8 designed to do.

9 It's suggesting that there are differences in the  
10 spatial value of milk that might be accounted for in  
11 setting or making adjustments to a Class I price surface.

12 Q. And I mean, to the extent that they are relied  
13 upon for that purpose, they will then help set the actual  
14 minimum price that has to be paid, right?

15 A. That depends on the extent to which any of the  
16 results are relied upon for that purpose, yeah.

17 Q. But you do understand that's the reason we're  
18 looking at this information, right?

19 A. I do understand that there is interest in  
20 evaluating whether our current Class I differential price  
21 surface is appropriate in the world of now as exemplified  
22 through model analysis from 2021.

23 Q. Okay. But you're here presumably because you  
24 think this information has something to contribute to the  
25 conclusion?

26 A. I'm here because I think this information has  
27 something to contribute to the decision-making processes  
28 related to whether or not those Class I differentials



1 should be modified.

2 Q. Okay. And -- okay. And just so we're clear, to  
3 the extent that they are modified based upon this  
4 information, then that becomes a mandatory payment  
5 obligation for Class I handlers, correct?

6 A. So I can certainly say that if the Class I  
7 differentials are changed, it becomes a mandatory  
8 obligation on handlers.

9 Q. And when you are assessing value, let's say at a  
10 place like Miami, that value reflects the cost of getting  
11 the milk to Miami, correct?

12 A. So as I have stated on a number of kind of  
13 previous responses, yes, that's one of the factors that  
14 affects what the value is in Miami. But it's not just  
15 what happens in Miami. It's not just about the  
16 transportation flow from any particular location to Miami.  
17 It's about the broader systemwide interactions that create  
18 that value at Miami.

19 Q. One of the factors affecting the value in Miami is  
20 the cost of getting milk to Miami; is that fair?

21 A. Yes. I previously noted that both the farm milk  
22 assembly, the interplant transportation costs, and the  
23 distribution costs are part of the transportation costs  
24 that are considered in the analysis.

25 Q. And -- and captured by your -- to the extent --  
26 hopefully captured by the numbers that your model  
27 establishes as values, correct?

28 A. They are definitely a part of the computations



1 that lead to that value being established.

2 Q. Okay. So -- and you have said more than once  
3 and -- that the model is, if you will, ignorant as to the  
4 terms of the Federal Order system, correct?

5 A. The model does not take into account the -- what I  
6 would call the behavioral incentives that Federal Milk  
7 Marketing Orders provide. It is simply a supply chain  
8 model designed to evaluate milk values.

9 Q. Does it take into account the provisions of the  
10 orders with respect to, for example, transportation  
11 credits?

12 A. No, it does not.

13 Q. Okay. So that -- okay. So that -- that sort of  
14 goes beyond behavioral aspects of the model to payment  
15 obligations of the order -- let's start that question  
16 again.

17 That goes -- that goes beyond the behavioral  
18 aspects of the orders to the payment obligation to the  
19 orders; is that right?

20 A. So this model does not determine the payment  
21 obligations under the orders because it does not contain  
22 most of the Federal Order structure. It's simply a supply  
23 chain model. It's trying to come up with the spatial  
24 value differences for milk used in different classes.

25 Q. To the extent that the model would be relied upon  
26 to set Class I differentials, the people using the model  
27 in that fashion should recognize that the model does not  
28 reflect, for example, whether there are transportation



1 credits provided for in the orders; is that fair?

2 A. Yes. As I have previously stated, this is a --  
3 what I think of as a competitive benchmark that is  
4 ruthless about trying to have the system costs be the  
5 lowest possible that they can be. And so it does not take  
6 into account, as I mentioned before, anything related to  
7 passion about keeping a particular plant open, it does not  
8 think about the pooling provisions, or any of the pool  
9 dollars that are generated, and how that might influence  
10 behavior.

11 Q. And so to the extent that, for example, there is a  
12 recommended decision, awaiting final decision to require  
13 Class I handlers in the Southeast orders to pay for the  
14 transportation of milk into those locations, wholly apart  
15 from the Class I differential, that's -- that's something  
16 that your system -- your model just doesn't account for at  
17 all, correct?

18 A. So the model accounts for the transportation costs  
19 that would be -- and throughout the dairy supply chain,  
20 but it is not dealing with specific obligations on the  
21 part of anyone to make that payment.

22 Q. It -- so it does not account for the fact that  
23 Class I handlers may be required by law to pay for those  
24 transportation costs under the recommended decision,  
25 wholly apart from whatever their Class I differential  
26 obligations are; is that right?

27 A. It does not include any of the payments that would  
28 be required under Federal Milk Marketing Orders because it



1 focuses only on logistics costs.

2 Q. And -- all right. Are you willing to go so far as  
3 to say it would be wrong to use the values established by  
4 your model in setting Class I differentials to the extent  
5 that there's another provision in those three Southeast  
6 orders which is on the cusp of being adopted that requires  
7 Class I handlers separately to pay for the cost of getting  
8 milk to those locations?

9 A. Actually, first, I have tried to state previously  
10 that I'm here to provide information as an analyst. So  
11 questions of right or wrong are not really, I think,  
12 generally within my purview.

13 And second, if I were trying to understand the  
14 implications of having a transportation payment  
15 requirement in addition to the transportation costs that  
16 are represented in this model, I would actually want to  
17 have the ability to model that and analyze it to come up  
18 with a better answer to say, here's what I think the  
19 implications would be. And that's kind of different than  
20 saying right or wrong.

21 Q. I take it you were not asked by National Milk to  
22 take a look at the recommended decision regarding  
23 transportation credits in the three Southeast orders and  
24 determine to what extent that might affect how the work  
25 you had done that we have been looking at today might need  
26 to be adjusted?

27 A. So I was not asked to look at that decision. But  
28 I also think that the nature of what is included in the





1 model and what is not included in the model really implies  
2 that it would not be possible to consider that even if I  
3 had reviewed that decision.

4 It's actually not saying who pays what is  
5 essentially what we're talking about here. So it's not  
6 saying who pays those things. It's considered as a broad  
7 systemwide cost.

8 Q. Right. But I mean, we both know this whole  
9 exercise is being undertaken for the purpose of  
10 determining what Class I differentials should be, correct?  
11 That's why we're here, correct?

12 A. I would not disagree.

13 Q. Okay. Let me switch to a different topic, which  
14 is the question of adjustments being made after your model  
15 was completed, okay? Do you know what I'm talking about?

16 A. Uh-huh.

17 Q. You should say yes or no.

18 A. Yes.

19 Q. Okay. So your model attempts to determine value  
20 based upon the current locations of milk supply.

21 Obviously, you do a lot more than that, but I  
22 mean, that's part of what you are doing, correct?

23 A. Yes. That's part of what we're doing.

24 Q. Let's assume a situation which 25 years ago when  
25 the model was last -- the precursor model was last used to  
26 determine what the Class I differentials would be. And  
27 let's assume at that time you had two large cities,  
28 30 miles apart, and the milk was being supplied, at that



1 time -- I'm going to make the example somewhat  
2 oversimplified -- from the south of those two cities,  
3 okay? And those cities lay east and west of each other,  
4 okay?

5 So under that scenario, it would be -- it would  
6 have been the case the model would have potentially showed  
7 values the same in those two cities because the milk was  
8 coming from south, and cities were equal distance from  
9 those sources of milk; is that fair? That would be how  
10 the model would work?

11 A. So I think you have captured some of the logic.  
12 But I do have to remind us all that we can talk about one  
13 milk supply and two cities, but the values and the surface  
14 are determined by the interaction of all of the millions  
15 of variables and possibilities.

16 So in general, we see a certain kind of gradient.  
17 We might say if we had a different demand at a different  
18 location, that could modify somewhat what that gradient  
19 might be. But it's difficult to state if you have two  
20 cities and one milk source, what the implication of that  
21 would be in the basis of a modeling event, even like what  
22 we did in the simpler version in 1997 -- well, they did in  
23 1997.

24 Q. What's the -- there's a term -- I think I could  
25 say it, but I'm going to ask you to say it instead -- in  
26 Latin, where economists use it all the time, all other  
27 things remaining the same? Is it *ceteris paribus*?

28 A. *Ceteris paribus*.



1 Q. Okay. Ceteris paribus?

2 A. Uh-huh.

3 THE COURT: Do you know how to spell that in  
4 Latin?

5 MR. ROSENBAUM: C-E-T-E-R-U-S (sic)? Ceteris  
6 paribus?

7 THE WITNESS: C-E-T-E-R -- and I think it's "I,"  
8 but you're saying "U" -- I-S, paribus, P-A-R-I-B-U-S. And  
9 that's some card I should carry in my wallet as an  
10 economist that I always have it available to me to spell  
11 that, but I don't.

12 THE COURT: And it means everything is always the  
13 same?

14 MR. ROSENBAUM: Everything else remaining the  
15 same.

16 THE WITNESS: Other things being equal.

17 THE COURT: Oh, of course.

18 MR. ROSENBAUM: Yes.

19 THE COURT: Thank you.

20 BY MR. ROSENBAUM:

21 Q. So if -- if now the milk is coming from the west  
22 rather than from the south to those cities, then other  
23 things remaining the same, your model today could well  
24 produce a value in the -- in the western of the two cities  
25 that would be lower than the value in the eastern because  
26 now the milk has to go an extra X miles to get to the --  
27 to the eastern city.

28 Is that -- is that just a fair way to -- a



1 simplified way to think about how the model would work?

2 A. It's a simplified enough example, but I get the  
3 idea. So generally if you have to move milk a longer  
4 distance along the same trajectory from the same source,  
5 you would expect to see a higher marginal value of milk at  
6 that city location than a city closer to that same supply  
7 source, again, ceteris paribus.

8 MR. ROSENBAUM: That's all I have. Thank you.

9 THE WITNESS: Okay. Thank you.

10 THE COURT: Are there other questions before I  
11 call on the Agricultural Marketing Service?

12 There are none. I invite the Agricultural  
13 Marketing Service to question Dr. Nicholson.

14 CROSS-EXAMINATION

15 BY MS. TAYLOR:

16 Q. Good afternoon.

17 A. Good afternoon.

18 Q. I was thinking we might not be done by 5 o'clock  
19 today, but you might luck out.

20 A. I'm counting on USDA to come through for me.

21 Q. Okay. Well, let's see how we can go through these  
22 questions.

23 I'm going to try to stick to questions out of  
24 Exhibit Number 302, which is your longer statement.

25 A. Is it okay if I pull it up on my computer?

26 Q. Yes. Because I'll probably refer to some page  
27 numbers, etcetera.

28 A. I have that up now.



1 Q. Okay. Some of the questions is just to help us  
2 kind of synthesize what we have heard over the past few  
3 hours just to make sure we're all clear, and there will be  
4 some other kind of more technical questions.

5 So in the start, in your summary you talk about  
6 how the model is -- produces these location-specific  
7 values to be used as a competitive benchmark. And I think  
8 what I heard you define that earlier was it's kind of like  
9 in the perfect world that's the lowest cost solution?

10 Okay.

11 A. Yes.

12 Q. And your number 3 listed in your summary of key  
13 results talked about some of the reasons that we will see  
14 differences in these spatial values. You list a number of  
15 things, supply lo- -- changes in supply, changes in demand  
16 locations, etcetera.

17 And one of my questions was to ask you, is there a  
18 way we could kind of delineate those factors. But I think  
19 heard you say before that that's not really possible. If  
20 we wanted to see how much is the change in supply or the  
21 supply is now and figure out what impact did that have, we  
22 are not able to do that with these results currently?

23 A. With the current results, that's correct. So in  
24 principle, and we have done analyses along these lines, we  
25 could say what if we have the equivalent 2016 supply,  
26 which is the last time prior to this that we updated it,  
27 and in 2021, and the same thing we would do in terms of  
28 changing demand.



1 I think the key is, it's possible to do that, but  
2 it has to be sort of done one thing at a time to  
3 understand the implications of, say, a supply change  
4 versus a demand change versus a transportation cost change  
5 versus a plant location type change.

6 So in principle, it's possible to use the tool to  
7 do that. It's a bit challenging to think about whether we  
8 should use, like, a change over six years from 2015 to  
9 2021 to accomplish that. That would only tell you in  
10 these six years, this is what happened.

11 Q. Okay. So on the next page, page 4, you are  
12 talking about how the large model is 3108 counties. The  
13 smaller model, I think, had about 100 or so different -- a  
14 few hundred multi-county regions is how you describe it in  
15 your paper.

16 A. Yeah. And actually if you have a copy of the  
17 R.B. 97-09, again, that Figure 6 provides a rough idea of  
18 the way in which the multi-county regions were aggregated.

19 Q. And so when you have a sentence that says, "the  
20 smaller model also allows more direct comparison with  
21 prior analyses," are you talking about the '98 run, or are  
22 you talking about what you just mentioned, which was 2016?  
23 What is the prior one you are talking about?

24 A. More like 2016. So when we began developing the  
25 database for this, one of the things we do is run a series  
26 of different model checks to make sure that we have at  
27 least reasonably consistent data, and then one of the  
28 things that we also typically do is go back and look at --



1 once we have generated initial price surface, we go back  
2 and look at a previous year's price surface, in this case,  
3 the last one prior to that was 2016, and say, is there  
4 something crazy going on here that would suggest that  
5 there is an issue with the model data.

6 Q. Okay.

7 A. So we typically do that kind of check as an  
8 informal visual thing, just to highlight whether or not we  
9 should go back and look at any particular aspects of the  
10 data inputs for the model.

11 Q. And you did this in this case?

12 A. Yes. For both the spring and the fall months.

13 Q. Okay. And if I heard correctly from some previous  
14 questions, one of the reasons you do both the large and  
15 the small versions of the model is, one, it's -- as  
16 according to your paper, it's quicker to do the smaller  
17 version, but also, you can see your product flows on the  
18 map because you have less lines, let's say. So visually  
19 you get an idea of what's going on?

20 A. Yeah. So, for example, I didn't even ask --  
21 Dr. Stephenson is the one who does the mapping for these.  
22 I didn't even ask him to do the map for the fluid milk  
23 distribution routing because it would basically be this  
24 massive, ugly, spiderweb of orange lines, and it wouldn't  
25 help us to -- and the sizes of the flows are also  
26 indicated by the thickness of the lines. And so you would  
27 have a lot of lines that were a mess, and then they would  
28 also be very similar in size because of the smaller



1 amounts of milk going to individual counties.

2 Q. Okay. And so when you did the different model  
3 types, is it just the large model run results that you  
4 gave to National Milk?

5 A. So, yeah. So we did both of those, and the  
6 assessment is that they generate very similar outcomes.  
7 When we have the 3,108 model, we actually have more data  
8 points in a sense to work with, and so that was -- that  
9 was what we did and reported only the mapping for the  
10 smaller versions of the model to give a -- and, again, the  
11 primal part is really to focus on providing an example of  
12 what the kind of information that the model provides, not  
13 so much to be important for the setting of Class I  
14 differentials.

15 Q. Okay. And so for the way you ran the model, I  
16 think it's in here somewhere, but I want to make sure is  
17 it clear, that are the results constrained by the capacity  
18 of each processing location? I know you talked about how  
19 you went through and you talked some in cross and you got  
20 help from National Milk on plant locations, for example,  
21 on which plants might be closing.

22 But how did you come up with processing volumes,  
23 would be one question? And the second question is, does  
24 the model -- is the model constrained by those volumes?

25 A. So, yes, let me start with the second of the  
26 questions.

27 So the model is constrained in the sense that  
28 plants can only process up to the allowable volume, and





1 this is expressed in terms of a total milk volume, farm  
2 milk volume that can go into the plant, not in terms of  
3 the products that can come out of it.

4 So the data for that are, to be honest,  
5 incomplete. So we have estimates that primarily were  
6 developed by Dr. Stephenson over time of the capacities at  
7 most of the larger plant locations. But particularly for  
8 smaller plant locations, there's some ice cream maker in  
9 Wisconsin, we don't really know what their capacity is.

10 So we allow the ones for which we have information to be  
11 constrained, and that's, you know, the largest proportion  
12 of the milk and products that would be produced are under  
13 those constraint plant locations. Which actually then  
14 kind of conditions what the rest of the model is going to  
15 do, because that milk will probably go there first, and  
16 then only be available to some of those smaller facilities  
17 like -- it's not after in the sense of time, but would be  
18 made available to those plants that are not constrained.

19 So since we have some plants that are constrained  
20 when we have the data, and we have other plants that are  
21 not constrained, but the not constrained plants tend to be  
22 the smaller plants.

23 Q. And so they would kind of be filled second in a  
24 way; is that what I'm hearing?

25 A. It's kind of along those lines. Basically if you  
26 have a favored plant location, then you would want to use  
27 all the available capacity at that plant location, and  
28 then once you can't do that anymore, then you got to think



1 about, where else do I go with that milk, if you will.  
2 But it depends crucially on that constrained plant  
3 location being a location that the model thinks is good in  
4 this broader system to minimize costs.

5 Q. And so could you give an estimate of -- of the  
6 plants that were accounted for in the data, how many of  
7 them do you think had volumes so they were constrained,  
8 and percentage-wise maybe how many were -- or maybe by  
9 volume, total volume of milk?

10 A. Yeah. I'd actually have to try and go back and  
11 look at that. But I think that we do have the majority of  
12 milk going into the different plant types, particularly  
13 fluid, cheese, butter, and powder plants were under  
14 constraints. For an MPC product, or ice cream product, we  
15 have less coverage for those, but they tend not to be the  
16 big volume drivers.

17 Q. Okay. Your model took into account imports and  
18 exports --

19 A. Yes.

20 Q. -- locations. And exports have certainly changed  
21 a lot since 2000.

22 So I'm curious if you can maybe opine a little bit  
23 on how you think that might have influenced the results or  
24 had an impact on the results, if at all?

25 A. Yeah. I guess this falls again in the general  
26 category of it's a little bit hard to determine what  
27 causes what without doing a little bit more parsing out of  
28 the different influences. But I can say that one of the



1 key differences between this model version and even some  
2 of the previous ones in the 2010 era were that we used to  
3 have -- because when exports and imports were less  
4 important to the U.S., we used to have three import and  
5 export nodes, like major ports. I think they were L.A.,  
6 Houston, and New York. And with the growing amount of  
7 export volume going out through different ports, you think  
8 about a port like Seattle taking a lot of powder products  
9 to Asia, we decided that we would actually use Census  
10 Bureau-generated port district data to assign the actual  
11 export quantities for the different products to those  
12 locations. So it's like an extra demand at that  
13 particular demand node. Right?

14 So why it's difficult to answer your question  
15 about what difference did exports make is that the total  
16 volume of exports is up, but also so is the total volume  
17 of milk supply. And so we can try and, like, take out the  
18 milk equivalent of those exports and see what difference  
19 it makes, but without doing something like that, it's kind  
20 of difficult to parse out exactly what that difference  
21 made. But we did want to account for that to recognize  
22 that that is a part of this broader system that determines  
23 those price relatives.

24 Q. Okay. Which would probably make sense if we're  
25 exporting close to 20% of our milk to account for that  
26 demand, right?

27 A. Yes, that's why we did it.

28 Q. Okay. I wanted to turn to page 8. This is your



1 table of product categories. And I just want to make sure  
2 we're clear on the record what two column headings mean.

3 A. Okay.

4 Q. So the first column is the product, and then the  
5 next two columns indicate whether it's a final product or  
6 it's an intermediate product. And so I just want you  
7 to -- so the fourth and fifth column, if you could just  
8 make clear for the record what those two columns mean.

9 A. Okay. So if it's okay, I'll say the final product  
10 in this model is things that went to final demand. We can  
11 think about that being consumers, but we can also think  
12 about it being foodservice or institutional buyers.

13 An intermediate product in the terminology that  
14 we're using here is a dairy product that is used by  
15 another dairy manufacturing process but came from a dairy  
16 plant, and I have got examples there of the different  
17 products.

18 So the IP allowed to make this product is  
19 basically saying, for fluid, that that can be a  
20 combination of cream and skim based on the idea that when  
21 most milk hits a processing plant, it's often separated  
22 into those two different entities and then brought back  
23 together in the correct proportions to make the different  
24 fat milk that's sold at retail. Right?

25 So something like ice cream, we actually have a  
26 separate product category for ice cream mix that can be  
27 produced at particular plants. That is the input into ice  
28 cream manufacturer.



1 Nonfat dry milk, the IP allowed to make this  
2 product, in our terminology, skim milk and cream are  
3 considered these intermediate products. So to make  
4 nonfat, we would dehydrate the skim milk, and the -- I  
5 guess that's the fifth of the columns, says product  
6 allowed as IP in, basically we're saying that you can use  
7 nonfat dry milk in the manufacture of fluid milk. And  
8 actually I should note that that's really only in  
9 California to meet their higher composition standards.  
10 But it can be used to make yogurt, it can be used to make  
11 American cheese, other cheese, casein, and ice cream mix.

12 So does that give you enough examples of what the  
13 definitions are?

14 Q. It does. Thank you.

15 A. Okay.

16 Q. I want to turn to page 11. 2.8, Processing and  
17 Transportation Costs. You mentioned how Dr. Stephenson  
18 was -- you know, you all kind of separated assignments  
19 when it comes to data, and I think you said that  
20 processing costs came from Dr. Stephenson.

21 And you mention --

22 A. Yes.

23 Q. -- that these costs are based on previous cost of  
24 processing studies updated to reflect 2021 cost  
25 structures.

26 There's been a few studies of his on costs put  
27 into this hearing record, so I'm trying to figure out  
28 which one you are talking about.



1           A.     So the input for processing costs in this model  
2     derived from sort of a long series of our looking at the  
3     evolution of processing costs over time.  And essentially,  
4     what we did was look at the 2016 processing costs that we  
5     had, and Mark provided an adjustment factor that he  
6     thought was relevant to bring that to 2021.

7                     And I imagine that he used information available  
8     from at least the first of the costs of processing studies  
9     that he had done, but I don't know specifically how he  
10    arrived at what that adjustment factor should be.

11           Q.     Okay.  Thanks.

12                     And then down when you are talking about  
13    transportation costs, and you used a standalone  
14    transportation cost simulation program.  I was wondering  
15    if you could expand on that.

16                     And in my mind, what I think I hear you saying,  
17    which is something that Dairy Programs can do itself  
18    sometimes when we do modeling, we figure some other things  
19    out externally, and then input those results into the  
20    model, so I -- that's what I'm interpreting that as what  
21    you did, but I would like you to kind of expand on how  
22    that was done.

23           A.     Yeah, you have the basic idea.  We used a separate  
24    model to provide the transportation cost inputs for this  
25    model.

26                     And I think I mentioned earlier that there's been  
27    an evolution of a model.  It started out as an  
28    extension-based tool to help haulers understand the full



1 cost of moving milk from a farm to a processing plant, and  
2 that has been refined to be a little bit broader structure  
3 to allow the assessment of the different costs that I  
4 mentioned.

5 And I think I mentioned previously that the way in  
6 which this tool was used was -- again, this is something  
7 that my good friend Dr. Stephenson is responsible for --  
8 was to run a large number of different possible routes  
9 with that standalone transportation costing tool, and then  
10 to understand what the statistical relationship was  
11 between the distance of those routes -- and these are the  
12 actual road mileage type routes, somewhat similar to how  
13 we have done this in the model here -- and then to  
14 establish a statistical relationship that is typically a  
15 non-linear relationship that would look at all of those  
16 different cost points relative to the distance and  
17 establish what sort of a mean value would be at a distance  
18 of X number of miles.

19 So does that provide enough information to help  
20 you understand how we use this approach?

21 Q. It does.

22 And I had another question kind of later on. I  
23 think you mentioned you used updated fuel cost data to  
24 reflect 2021 diesel prices. Are those factors in this  
25 model or that just gives you the relationship and then  
26 your USDSS model puts in diesel prices separately, for  
27 example?

28 A. Yeah. So let me try and clarify that, because I



1 think it's an important point.

2 The initial transportation cost model is used to  
3 generate what we call a cost matrix that has a cost to go  
4 from any origin of the 3,108 to any destination of the  
5 3,108, which relates to that function of distance. Okay?  
6 We then -- and that actually includes the operating costs  
7 that would include wages and tires and fuel in that  
8 initial estimate.

9 But then in order to better reflect regional  
10 differences in fuel costs and wages, we adjust that by a  
11 factor that shows how the average -- or how a wage or a  
12 fuel cost in a particular location is related to the  
13 national average.

14 So if it's 95 -- if diesel is 95% of the national  
15 average cost, that 95% is used to reduce the diesel cost  
16 at the starting location where that pattern exists. And  
17 it could be, you know, 5% more in which case you would  
18 multiply it by 1.05.

19 So we start with a base of the transportation cost  
20 from the model -- sorry, I'm using my professor hand --  
21 and --

22 Q. I appreciate this lecture, so this is good.

23 A. Okay. And so we then adjust that in the -- in the  
24 actual model simulations with the USDSS model to account  
25 for the regional differences in wages and in fuel costs.

26 Q. Okay. And so I think I remember you stating you  
27 used DOE data for fuel costs?

28 A. Right. And so that would actually, excuse me,





1 come in where the average -- that would be the thing that  
2 describes what the average national price would have been  
3 in October for diesel, and then we have a regional  
4 adjustment based on the DOE data.

5 Q. Right. Okay.

6 So the data you did -- you use for kind of like  
7 your beginning index, I'll call it that, is for May of  
8 2021?

9 A. May and October for preceding months, yeah. So  
10 the base, if you will, that you are going to adjust up or  
11 down is that May and October value.

12 Q. Okay. And then the wage data, what -- you used  
13 wage data from BLS. I'm assuming that was specific to  
14 trucking?

15 A. Yeah. I don't remember the specific BLS category,  
16 but it was designed to be specific to trucking labor.

17 Q. It's a little bit different as Mr. English talked  
18 about, and before -- when we did reform, it was informal,  
19 and we kind of knew these things or could work with the  
20 people. This is our only opportunity to ask these  
21 questions.

22 A. I appreciate that.

23 Q. Okay. I want to turn to the Figure 5, which is on  
24 page 13.

25 A. Yes.

26 Q. And I think in that figure what you said, because  
27 this is using the smaller run, less locations, so kind of  
28 plant locations might be grouped together in a larger



1 triangle to represent a few plants that are there.

2 A. Absolutely. Yes.

3 Q. I did have a question. If we noticed -- well, let  
4 me -- I just want to get your feel on how kind of accurate  
5 you think those plant locations are, if, for example,  
6 based on looking of these things -- you know, our own  
7 knowledge, and not my knowledge, but the people sitting  
8 behind me's knowledge, working out in our Federal Order  
9 offices see a dot, let's say in the part of South Dakota  
10 where they're not quite sure there's a plant there, but no  
11 dot maybe in North Dakota where we think there is a plant  
12 there, I mean, I think you talked earlier about the plant  
13 list was probably the hardest part of this whole --  
14 putting together the plant list is probably the hardest  
15 part to put together for the model.

16 A. It is. It's the place where the least amount of  
17 publicly available information exists. I think is -- that  
18 makes it the bigger challenge.

19 Q. Okay. So one question is, is kind of these  
20 differences in where maybe a plant is or isn't, because  
21 this is a smaller model, is that like a mapping problem  
22 based on the fact that you just used the smaller runs to  
23 do this, not necessarily all the plant locations that you  
24 did in the larger run?

25 A. So this has been a question that we have been  
26 getting -- well, at least I have been getting since the  
27 time I started working on this model in 2000, and they  
28 actually got it before in 1997. It has to do with exactly



1 what you are talking about, the aggregation of plants that  
2 are at other specific locations to the locations that are  
3 available in the model.

4 And so I can't remember the specific instance, but  
5 it was -- there was a conversation they were having, and  
6 somebody said, "You don't have my plant on there. My  
7 plant's over here, it's not over here." I said, "Yes, we  
8 know, because that actual triangle location is accounting  
9 for all the processing capacity, whether it's right there  
10 or not. It's like, in the multi-county region, this is  
11 the location that we chose to aggregate where that plant  
12 location -- or plant capacity was available."

13 Q. And that multi-county region is kind of going back  
14 to the study from 1998 and the circles, right? So that  
15 region could be a large circle where that dot represents  
16 or a small circle?

17 A. Yes. And as I noted, and in locations where there  
18 was a good deal of milk supply in a dense area, like the  
19 Central Valley of California, it's pretty much county by  
20 county. In other regions where at least at that time  
21 there was less milk supply, you had less dense coverage,  
22 and you were aggregating more plant capacity at a given  
23 location. So I can understand how the specific flows here  
24 would make it look like it's not representing the plants  
25 that you are aware of.

26 Q. So we had one question, if we can compare Figure 5  
27 to Figure 4. So Figure 4 is on page 7.

28 A. Yep. Thank you.



1 Q. And Figure 5 is on page 13.

2 And I want to point to the area in North Carolina  
3 on the coast where there's on Figure 5, there's a triangle  
4 there. So that would represent some fluid plant in that  
5 area?

6 A. Let me look at the Figure 5.

7 Okay. I don't know the reason why there isn't a  
8 blue dot where there is a dot in Figure 5. So, again,  
9 these maps were, again, generated by Dr. Stephenson.

10 Q. Maybe I'll get the privilege to ask him that  
11 question.

12 A. Perhaps you will.

13 Q. Okay. I want to make sure it's clear for the  
14 record, because we just had the question come up. I think  
15 what I heard from you in regards to -- earlier, I think  
16 this was questioning for you from Mr. English -- or  
17 Mr. Rosenbaum, while if there's a kind of a plant there in  
18 your map that's not really there, or a plant -- a plant  
19 missing that is there, in the big picture that doesn't  
20 really change your results?

21 So, for example, maybe the missing plant in North  
22 Carolina or something, that doesn't -- in the big  
23 picture -- doesn't in the big picture kind of change the  
24 results out of the model?

25 A. Actually, I think the Figure 5 is actually showing  
26 that the supply plant is there. It's just omitted in the  
27 general graphic that's talking about the dairy process --  
28 and actually, I think maybe one of the reasons that that



1 may be omitted is we didn't have a capacity for that  
2 plant, and therefore it didn't show up in the capacity  
3 graphs that are shown in Figure 4. I don't know. I'd  
4 have to actually better understand that.

5 But -- so the plant is definitely there for the  
6 purposes of processing something in the analysis that we  
7 did. What seems funny is that it doesn't show up as  
8 listed in Figure 4.

9 Q. Okay. Okay. I'm on page 14, into 15. So here  
10 you are talking about milk assembly -- well, that's the  
11 figure, Figure 6. I don't want to talk about 6.

12 But I did want to move to the second -- page 15 in  
13 that top paragraph. The second sentence from the bottom  
14 of that paragraph says, "The model results are not  
15 sensitive to changes of plus or minus 5%, and demand  
16 values are estimated transportation costs."

17 So I just wanted to make sure it's clear, what you  
18 are saying is if -- if there's only a small change, the  
19 model's not going to pick that up or won't change its  
20 results if there wasn't the change greater than 5% in one  
21 of those variables?

22 A. Yeah, that's the correct interpretation. And  
23 perhaps a little bit of background on that is helpful to  
24 have.

25 I mentioned in the starting statement that I made  
26 that this has actually been peer-reviewed research that's  
27 been published. And one of the things that the reviewers  
28 required us to do was that kind of analysis to assess the



1 sensitivity of our results to those kinds of changes.

2 And so I mentioned earlier that we can tweak those  
3 things to evaluate their impacts. And in general, what we  
4 find is it takes a really large change, like the shifts in  
5 population that we have seen and the locations of milk  
6 supply and the transportation costs being markedly  
7 different, for us to see a markedly different result from  
8 the model.

9 Q. On page 17 you have Figure 8, milk production by  
10 region. And you list the four regions, but I don't think  
11 they are defined anywhere of what encompasses those  
12 regions.

13 So could you elaborate on that a little bit?

14 A. Yeah. So, again, we talked about the division of  
15 labor between Dr. Stephenson and myself, and I mentioned  
16 that he was the one who was responsible for pulling  
17 together the milk supply data.

18 I hope you will have the opportunity to rigorously  
19 question him about Figure 8.

20 Q. Well, hopefully the person calling him on the  
21 stand might know that we were going to ask him these  
22 questions, so thank you.

23 This is -- I don't -- I'm trying not to go back  
24 and forth. I want to go to page 21 where you show the pie  
25 charts of the changes in the transportation costs as a  
26 percentage of the total from 2011 to 2021.

27 So, for example, fuel costs represented 35% of  
28 transportation costs in 2011, while they only represented



1 25% in 2021.

2 We were wondering if you have kind of what are  
3 the -- what are those values for those two years?

4 A. I agree that the breakout is perhaps relevant to  
5 show the shifts among costs, but actually figuring out  
6 what the total costs would be is also important.

7 And I will again ask you to refer to my esteemed  
8 colleague, Dr. Mark Stephenson, to provide additional  
9 details because he did that component of it.

10 Q. Okay. I will wait. And I wrote Mark on my  
11 sticky, so we're going to come back to that.

12 And I assume then that he also did the Figure 13?

13 A. Yes, he did.

14 Q. This is why we're going to get done by 5:00.

15 A. Excellent.

16 Q. I did have a question. So your results that you  
17 gave to National Milk, they are in Exhibit 300 that we  
18 have discussed, include the base differential of a \$1.60.

19 A. That's correct.

20 Q. The proposed results that are kind of -- from  
21 National Milk's proposal results in Column S on  
22 Exhibit 300 include a 2.20 base differential.

23 A. That's my understanding, but I have not had any  
24 direct input at how that was calculated.

25 Q. But assuming that's their -- that's what's in  
26 that -- assuming that the 2.20 is what they put in their  
27 base differential, then is it right to say that \$0.60 --  
28 part of the \$0.60 difference between what the model came



1 up with versus what they proposed could be attributed to  
2 the different base differential that you -- that each  
3 party assumed?

4 A. Again, I -- I don't know enough about how that  
5 process was done to say you are just adding \$0.60. I  
6 actually don't think that was what was done. But I don't  
7 know exactly how that set of values was assigned and the  
8 role that the 2.20 played in that.

9 Q. I'll look forward to asking National Milk about  
10 that.

11 A. I think you will have an opportunity.

12 Q. Okay. On the bottom of 23 you talk about Kriging,  
13 K-R-I-G-I-N-G, is employed. And I think what I think you  
14 are saying is, right, we get all these values at certain  
15 locations, and you put it in this -- use this method to  
16 kind of make a one continuous map. Even though there  
17 might not be milk or a plant in a lot of locations, you  
18 still assign a value in that?

19 A. Yeah, that's -- that's exactly the idea. It is an  
20 algebraic algorithm that allows you to extrapolate values  
21 based on -- if you think about -- say you have got a  
22 series of marginal values at Class III plants, but you  
23 don't have one in every county that you can use to say  
24 that would be the value in that county.

25 This is an algorithm that allows you to take those  
26 existing values, use different weighting schemes, and  
27 assign the value to every county. And it's fairly  
28 commonly used in this kind of spatial mapping type work.





1 I guess one other thing I'll add is, that in  
2 contrast to some of the previous work that we have done,  
3 there are different ways to implement this algorithm. And  
4 the way we initially were implementing it when we started  
5 this process, we'd say if a -- if -- it's the linear  
6 distance between two points, so if you are going to cross,  
7 like, Lake Erie, you would say you can just take the value  
8 and go right across there, and we realized that that was  
9 not appropriate.

10 And so it's been modified to reflect the fact that  
11 it actually has to respect the borders that are part of  
12 that mapping system so that you are not coming up with  
13 funny values for things that look to be closer than they  
14 are, because the straight line distance is not the same as  
15 what you have to have happen by moving the product.

16 Q. And when you say that's what you did initially, is  
17 that what was done back in the '90s or what -- what that's  
18 the initial period?

19 A. Well, initially in the '90s, but also in the early  
20 iterations of this model in the 2000 era we were using  
21 that without recognizing the importance of accounting for  
22 that geography.

23 Q. Okay. We're looking at Figure 15 on page 24 with  
24 all these pretty lines, pretty wavy lines. And this might  
25 be a Mark thing --

26 A. It is a Mark thing.

27 Q. Okay.

28 A. Can I say that to everything and then we'll be



1 done really quickly or --

2 MR. ENGLISH: No.

3 THE WITNESS: I guess I'm under oath. Sorry.

4 BY MS. TAYLOR:

5 Q. Well, I'll ask it anyways in case you know, but  
6 I'll write it down here to ask him.

7 Is the difference between lines, like, a 10%  
8 change in -- is that -- because this -- yeah, \$0.10,  
9 sorry, not 10% -- \$0.10 change? Because some of these  
10 numbers are kind of hard to read.

11 A. Yeah, this is actually the way that we used to map  
12 it was only with the lines and then some colored  
13 gradation. What I think is a little bit challenging about  
14 this is you actually have the individual county levels  
15 being mapped, and on top of it you have this line surface.

16 And technically, we wouldn't need the line surface  
17 to help us interpret that so much except for the fact that  
18 there's kind of this very broad range of values that goes  
19 again from 1.60, you know, up into the 7s. And I think in  
20 putting the lines in there, Mark was trying to help guide  
21 the eyes to kind of where the break points were as opposed  
22 to just using the colors.

23 Q. Okay. Okay. Another question for you, and you  
24 talked a little bit about this with somebody, about kind  
25 of the art that goes into kind of taking the model results  
26 and then trying to bring them into the real world, not  
27 just what the model spits out.

28 And you talked about what kind of things might



1 people look at, factors go into different changes. And  
2 one, you talked about competitive relationships that  
3 currently exist, which the model does not account for.  
4 You also talk about places where geography gets in the  
5 way, so maybe that's mountain ranges or a lake.

6 A. So let me expand on that just a little bit, if I  
7 may.

8 So the geography that we have here is the road  
9 network. So if the road is going over a mountain and the  
10 milk and products are moving over a mountain, they are  
11 going over the mountain or they are not. It's not whether  
12 or not there is a mountain range. We don't account for  
13 any differential costs on a movement that would be going  
14 over a mountain range versus traveling flat across the  
15 plains once you got east of there. But we can have  
16 geography if it's based on the existing road network.

17 So when I was thinking about things that were more  
18 related to the transportation network, I was kind of  
19 thinking about we don't account for traffic congestion in  
20 metropolitan areas, for example.

21 Q. And maybe, back to my mountain example, maybe you  
22 don't count for it might cost more to go over that  
23 mountain, even though --

24 A. That's correct.

25 Q. Uh-huh. And that's something that -- that's kind  
26 of the art of people with knowledge of that marketing area  
27 might be able to attest to?

28 A. Yeah. And I should also say there's -- and I grew



1 up in San Diego, so I'm a little bit familiar with the  
2 California geography, but we can also think about how many  
3 arteries there really are to move product from a location  
4 like the west, and there aren't that many. So that  
5 actually might account for greater congestion on those  
6 routes, and we didn't account for that in the system that  
7 we use, which is sort of like this average costing of  
8 routing plus an adjustment for fuel and wages.

9 Q. Okay. I think in your statement somewhere you  
10 define disorderly marketing can result when differentials  
11 are greater than transportation costs.

12 Does that ring a bell?

13 A. I'm not sure I used the word disorderly marketing.  
14 Let me have a look and see.

15 Q. My notes say it's on page 23, so we'll all flip  
16 there.

17 It's on the bottom of 22 into 23. So the sentence  
18 says, "If these values" -- and you are talking about  
19 differentials -- "were larger than the cost of  
20 transportation, then 'disorderly' marketing conditions  
21 could result with excess milk trying to find its way to  
22 the higher valued plants."

23 A. I'm still looking for where you are.

24 Q. At the bottom of page 22.

25 A. Sorry, I was on 23.

26 Q. Yeah, sorry. And then the sentence starts there  
27 and goes on to 23.

28 A. Thank you.



1 Q. Yep.

2 A. Okay. So --

3 Q. The question is, can you comment if you think you  
4 see where -- if there are any instances of that in your  
5 model results or you feel confident that your results are  
6 not overstating transportation costs?

7 A. So I guess I haven't done a systematic analysis to  
8 look at, like, whether a Class I differential for a  
9 particular movement was a bigger value than the  
10 transportation cost. I think generally what we see in the  
11 model results is that we're not really actually talking  
12 about the disorderly marketing per se, we're talking about  
13 can we evaluate what those transportation costs would be  
14 and how they affect what the marginal value of milk would  
15 be, for example, at that Class I plant.

16 But we don't have any kind of more systematic  
17 analysis of is the model saying something is too big  
18 relative to what the current Class I differential is.

19 Q. Okay. And then for your -- particularly for the  
20 fluid plants that you had in your data, does the model  
21 differentiate between ESL plants and traditional HTST  
22 plants? And do you -- if it does, do you think it  
23 impacted the results in any way considering they have kind  
24 of different distribution networks?

25 A. It does not currently make a distinction between  
26 those two milk products. Again, I mentioned earlier, nor  
27 does it deal with the differences in distribution for  
28 organic milk. But we have actually started talking about



1 that as more ESL milk has come online, do we need a  
2 separate category for that, and the basic challenge is  
3 being able to come up with the demand data to support  
4 that.

5 Q. Okay. Not going to ask you questions I don't  
6 think you're here to answer. Save that. Let's see.

7 So you talked a little bit about it, and I know we  
8 looked at the results from 1998, but does your -- did your  
9 model put out different surfaces for different product  
10 categories, the four classes of products, for example?

11 A. Yes.

12 Q. And does each one of those kind of have a zero  
13 point? I mean, they are all spatial values, so I assume  
14 just like the Class I surface you produced, those also  
15 have kind of like a zero starting point somewhere.

16 A. I guess I would have to go back and look at the  
17 data. My recollection is we have fewer of those zero  
18 points in part because of the way that manufacturing  
19 capacity is spread around the country.

20 Q. And do you -- would you know maybe what the range  
21 was in those surfaces?

22 A. So if we're thinking about whether or not there is  
23 a -- dare I say it -- a Class III price surface, the  
24 spatial analysis, which suggests that there is, my  
25 recollection is that surface largely goes from west to  
26 east -- and this is an approximate value, and I'm not  
27 remembering it so much from this as from previous work --  
28 that might be like \$0.50.



1 Q. Okay. And does the model solve for all four of  
2 those surfaces simultaneously?

3 A. It's generating a marginal milk value at all  
4 locations where plants are processing. We then can  
5 actually look at -- for the plants that would be doing  
6 products that would be in any of the classes, we can  
7 assign a value for that.

8 And so all of the information is being generated  
9 at one time, just as I have talked about everything kind  
10 of happens as a part of this broader system. And we don't  
11 typically map any of the other surfaces other than  
12 Class I. We have, for our own interest, occasionally done  
13 that, and then most people do not want to talk to us about  
14 a Class III price surface.

15 MS. TAYLOR: I think Mr. Wilson has a question for  
16 you.

17 CROSS-EXAMINATION

18 BY MR. WILSON:

19 Q. First of all, I'm not an economist to any degree,  
20 so there are terms that I don't know if you have used them  
21 today, but other people have used them in the past,  
22 related to shadow pricing.

23 A. Yes.

24 Q. That's equivalent to the -- to the marginal  
25 spatial price cost that you are talking about, right?

26 A. So the base marginal values generated in the model  
27 would be called by economists shadow prices or shadow  
28 values, and the only place where we depart from that is



1 when we add the \$1.60 to get to something that's  
2 comparable to the current Class I differential surface.

3 Q. Are there occasions where that shadow price is, on  
4 Class I, a lot different than the other II, III, or IV  
5 shadow prices? And if they are, what's your view on  
6 what's causing that?

7 A. So I think you are -- maybe you are talking about  
8 a broad set of differences between a Class III and a  
9 Class I value?

10 Q. Correct.

11 A. Yeah. So I mentioned numerous times that the way  
12 this model works is it's looking at all this information  
13 simultaneously. So as an example, we might expect that a  
14 Class III value would be different than a Class I value,  
15 except for that 1.60, in a location where there's a lot of  
16 cheese plants and a lot of milk going into cheese plants  
17 that are satisfying a demand. And it'd be particularly  
18 the case if there isn't a lot of demand for milk to go  
19 into a fluid plant. And I'm kind of thinking about in my  
20 mind an example of Idaho and Montana, right?

21 So there you could actually get differences  
22 between the need for milk to make cheese, which is big and  
23 strong, and saying, I need this right here based on the  
24 capacity, and not so much demand for fluid milk, and also  
25 a much sparser network of fluid plants in that region that  
26 mean you actually have to move that farm milk a lot longer  
27 distance to get it to a fluid plant.

28 Q. So if you had that county in Idaho that maybe had





1 a fluid plant sitting next to a cheese plant, and one of  
2 them was a lot more -- if Class -- if the cheese value  
3 shadow price was significantly greater than the fluid  
4 value, what's that telling you? What's that -- what's  
5 that telling us?

6 A. Okay. So I can imagine a situation in the real  
7 world where that might happen. In the model world, if you  
8 have a cheese plant right next to a fluid milk plant, the  
9 model only knows about the value differences due to what I  
10 mentioned before, like, there's a little bit of different  
11 component mix that's going into those different plants,  
12 and it only knows about what would the transportation  
13 costs be for me to go from one to the other.

14 So the model won't generate big differences in a  
15 Class III value and a Class I value, again, ignoring the  
16 1.60 part, if they are right next to each other, because  
17 it's only accounting for those specific differences in the  
18 component use and in the transportation that would take  
19 you to go kind of this hypothetically across the road from  
20 one plant to another.

21 So the model won't generate something that looks  
22 like a big difference between those two values, other than  
23 that 1.60 that would come into play. And so the model  
24 can't really inform very much about what would happen if  
25 we saw that.

26 Q. So in looking back at some of the maps that you  
27 didn't create, we see these assembly points for the fluid.  
28 Okay? And so I think of these shadow prices for the fluid



1 side as milk is trying to get to the Southeast of the  
2 United States, that shadow price gets larger and larger,  
3 meaning that it's costing more money to get that milk to  
4 processing. And so it's an assembly. It's -- it's --  
5 that shadow price is driven from the assembly side of farm  
6 to processor -- transportation, not assembly, right?

7 A. Yeah. So it -- again, I apologize for kind of  
8 keep saying this, but we have to think about this as a  
9 broader system that includes all the different elements.

10 I agree with the basic idea that the model is  
11 saying milk wants to move to the Southeast, it needs to  
12 move longer distances. And that's actually both the  
13 longer distances that we're looking at for a farm milk  
14 assembly to a plant, as well as the distribution routings  
15 that would take place, right?

16 So the basic idea I think is there. What exactly  
17 causes that has a broader set of factors. But the map,  
18 actually even for the small model, tends to suggest we  
19 have a lot of milk that wants to move through kind of a  
20 stair-step to the Southeast, and that's part of what's  
21 generating those larger differences between the current  
22 Class I differential and the model-generated marginal  
23 values at that location. It's just more costly to get the  
24 milk into those locations.

25 MR. WILSON: Thank you, Dr. Nicholson.

26 THE WITNESS: Thank you.

27 MS. TAYLOR: That's it from AMS. How about that?

28 THE COURT: Mr. English?



## 1 CROSS-EXAMINATION

2 BY MR. ENGLISH:

3 Q. I have one follow-up question.

4 On page 14, Figure 6, a question that Ms. Taylor  
5 asked a couple of different times about North Carolina.  
6 Isn't it, sir, that that is likely the Port of Wilmington,  
7 North Carolina, and is an export node?

8 A. Let me look. So I'm looking at Figure 5 --

9 Q. Yes.

10 A. And I'm looking at the fact that that is  
11 representing a fluid plant, which is not an exportable  
12 product in the model. And it's also apparently, at least  
13 if my eyes are not deceiving me, distributing milk.

14 Q. Okay.

15 A. So I think the omission is on the previous figure  
16 where it wasn't represented with the blue dot, it's not  
17 the omission for that, and it's not just an export  
18 location. Although Wilmington is an export location in  
19 the model.

20 MR. ENGLISH: All right. Thank you, sir.

21 THE WITNESS: Sure.

22 THE COURT: Ms. Hancock?

23 MS. HANCOCK: Thank you, Your Honor. We have no  
24 further questions. Appreciate your time.25 We would move for admission of Exhibits 302 and  
26 303.27 THE COURT: Is there any objection to the  
28 admission into evidence of Exhibit 302?

1           There is none. Exhibit 302 is admitted into  
2 evidence.

3           (Exhibit Number 302 was received into  
4 evidence.)

5           THE COURT: Is there any objection to the  
6 admission into evidence of Exhibit 303?

7           There is none. Exhibit 303 is admitted into  
8 evidence.

9           (Exhibit Number 303 was received into  
10 evidence.)

11          MS. HANCOCK: And may the witness be excused, Your  
12 Honor?

13          THE COURT: Is there anything you would like to  
14 add?

15          THE WITNESS: No. I thank everyone for the  
16 opportunity to make this presentation, and I thank you for  
17 helping me meet my other obligations.

18          Thank you very much.

19          THE COURT: Wonderful. Thank you, Dr. Nicholson.  
20 We really appreciate it.

21          And the witness may be excused.

22          THE WITNESS: Thank you.

23          MS. HANCOCK: I would just maybe tell you what I  
24 understand or -- I don't know if, Erin, if you want to go?

25          MS. TAYLOR: Sure. So on my list of people that  
26 need to go tomorrow, from National Milk, a Dr. Koontz, and  
27 from MIG, Dean Sommer.

28          THE COURT: I'm sorry, say those again?



1 MS. TAYLOR: Dr. Koontz, K-O-O-N-T-Z. And then  
2 that would be a witness for National Milk. A witness for  
3 the Milk Innovation Group would be Dean Sommer, I think --  
4 did I write that down correct?

5 MR. ENGLISH: You did, but it's really IDFA.

6 MS. TAYLOR: That would be an IDFA witness. I  
7 think Mr. English said his name earlier.

8 THE COURT: Dean Sommer.

9 And then I had written down last night Jeffrey  
10 Sims?

11 MS. HANCOCK: Yes. Well, for the -- he didn't  
12 have the need to go and be off by tomorrow, but assuming  
13 that we get Dr. Koontz on and off, and Mr. Sommer on and  
14 off, we would be prepared to put on Jeff Sims, Dr. Eric  
15 Erba. I think that Sally Keefe still at some point would  
16 like to go on.

17 MS. TAYLOR: That will take us through tomorrow  
18 and part of Friday.

19 And then Friday I have one in-person dairy farmer  
20 that I know from National Milk that's coming, and we have  
21 six farmers signed up to virtual testimony in the  
22 afternoon.

23 THE COURT: You know, that is wonderful because  
24 you just announced and you said, if you would like to  
25 testify, let us know by noon or something, and you filled  
26 it up.

27 MS. TAYLOR: People are listening.

28 THE COURT: I love it.



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All right. Is there anything else before we go off record for the day?

There is none. See you tomorrow morning at 8:00 a.m.

We go off record at 5:02 p.m.

(Whereupon, the proceedings concluded.)

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1 STATE OF CALIFORNIA )  
 ) SS  
 2 COUNTY OF FRESNO )

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4 I, MYRA A. PISH, Certified Shorthand Reporter, do  
 5 hereby certify that the foregoing pages comprise a full,  
 6 true and correct transcript of my shorthand notes, and a  
 7 full, true and correct statement of the proceedings held  
 8 at the time and place heretofore stated.

9

10 DATED: November 29, 2023

11 FRESNO, CALIFORNIA

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16 MYRA A. PISH, RPR CSR  
 17 Certificate No. 11613

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