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 AGRICULTURAL MARKETING SERVICE
 FRUIT AND VEGETABLE DIVISION
 FRESH PRODUCTS STANDARDIZATION AND INSPECTION BRANCH

SHIPPING POINT INSPECTION HANDBOOK FOR FRESH SHELLED PEAS FOR
 CANNING OR FREEZING

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INTRODUCTION

Several years ago the standards for fresh peas for canning studies (1) were undertaken, not only by the U. S. Department of Agriculture, but by various State agencies and commercial manufacturers. It was realized at the start that any set of standards must be such that would permit rapid inspection of peas under practical commercial conditions. Some of the

1/ The only change in this reissue of September 1956 is in the name of the Organization.

first experiments were based upon the flotation of peas in brine solutions of varying strengths. This method was not only cumbersome but often found to be too inaccurate when used for fresh peas. A second method was based upon the amount of moisture squeezed from a given sample of peas. This method was patented by a commercial firm but apparently has not been used.

- (2) A third method was a chemical test to determine the alcohol insoluble solids of the peas. This method, commonly referred to as the A. I. S. tests, is regarded as extremely accurate. However, the length of time necessary to make the tests prohibits its use under practical operations.
- (3) A fourth method, which was developed by private enterprise, is based on the measured resistance to shearing of peas placed in mechanical devices. Two well known machines for making such tests have been available to canners for several years. One of these machines is called the Tenderometer and the other the Texturemeter. The former is run by an electric motor while the latter is operated by hand. Each of these machines met the essential requirements for speed but results were not always satisfactory. They can only be used to determine average tenderness of the peas. For example, two lots of peas may require the same force necessary to shear them, but one lot may have peas of fairly uniform maturity while in the other lot there may be old peas and young tender peas. The averages of each of these two lots would not indicate their relative qualities. Furthermore, these machines cannot register such factors of quality as color, shriveling, heating, or other defects.
- (4) A few years ago the inspection service in Pennsylvania developed a system of grading based upon the crushing of individual peas by squeezing them between the fingers and using the tenderometer or texturemeter as a supporting test to verify their results. This system was used at a number of factories where final pack-out figures were obtained for comparison with the tenderness meters. Finally a conversion table (see pages 16 and 17) was drawn up which indicated the various percentages of each grade that could be expected in peas of various average meter tests.
- (5) The method of inspection described in this handbook is based upon the method developed by D. M. James and H. B. Trostle of the Pennsylvania Department of Agriculture; that is, individual peas are crushed between the fingers and sorted into the various grades according to tenderness, texture, moisture content, color, presence of starch, and any injury affecting the canning quality. A composite sample is also tested with the Texturemeter or the Tenderometer. The results secured by manual sorting of individual peas is then compared to the various grades shown on the conversion chart opposite the meter reading obtained by shearing the composite sample. If they agree, within reasonable limits, the inspection has proved satisfactory. If wide differences are apparent, further tests must be made.

VARIETIES

While it is not essential for the inspector to be able to distinguish the different varieties it is often advantageous to be familiar with them. There are many types and various strains of each, and any classification of them depends upon the chief interest of the person making the classification. In quality determination it is helpful to be somewhat familiar with variety characteristics. First, there are two general types, Alaskas and Sweets. (6)

The Alaska type is a smooth seeded pea, of early maturity, and light green in color. It is small in size, usually ranging from No. 1 sieve size up to No. 5 or larger, and begins to deteriorate in quality before the peas have reached full size, making a wide range of sizes in any vined lot. Young peas of this type are exceptionally tender and succulent, but they may become exceedingly hard and starchy as they become more mature. Two popular strains of this type are Superlaska and HF30. (7)

The Sweet type, so classified because the peas are sweeter in advanced maturity, could also be called the wrinkled type, as this is characteristic of the seed. Except for a few early varieties such as Mardella and Glacier, the size is considerably larger than the Alaskas, and top quality may be found in fully grown stock. This type is divided into two groups. The canning group is identified mainly by the light green color of the tender peas, and includes such varieties, in order of their maturity, as Ace, Glacier, Mardella, Surprise, Early Harvest, Pride, Cannors King, and Perfection. There are a number of other new varieties now being introduced or tested, some of which are only identified by letters and numbers. Cannors and seedsmen have been attempting to develop an early sweet type variety which will mature a large yield of high quality peas early in the season before the advent of hot weather and aphid infestations. The second group, commonly called the garden type, are large, dark green peas which are favorites of the canner, quick freezer, and market grower. Of this group, the Thomas Laxton and Topper have become very important for canning and freezing. Both have excellent texture and flavor. The Thomas Laxton is a mid-season variety and the Topper is later, which extends the canning season where these varieties are used together. Other varieties in this group are Little Marvel, Gradus, Laxton's Progress, Hundredfold, and Alderman or Telephone, but some of these are principally grown for the home garden or market and are not of importance to the canner. (8)

GENERAL INSTRUCTIONS

Each inspector should be thoroughly familiar with the instructions given in this handbook. He should study the material it contains and use it for reference. (9)

When in doubt about any matter, he should not hesitate to consult his supervisor. (10)

- (11) The handbook contains instructions regarding the method of inspection which should be learned in detail before any attempt is made to inspect peas under practical commercial operations. Inspectors must know complete details of the specifications of the U. S. Standards for Fresh Shelled Peas for Canning or Freezing.

SELECTION OF SAMPLES

- (12) In the inspection of peas, as in any other commodity, selection of the sample is of primary importance. If the sample is not truly representative of the lot, the results cannot be accurate, regardless of the care and precision used in the actual inspection. However, due to the methods of harvesting and vining peas, the possibilities of "stacked" loads are practically eliminated, and by following a few rules in sample selection it is relatively easy to secure representative samples.

- (13) All viners work on the same principal, that of whirling the vines against a rotating blade which breaks open the pods and shakes the peas free. The peas being heavier, fall to the bottom, while the refuse continues through the viner. In the newer type viners, the peas fall onto an endless belt which carries them into a box or bin at the end of the unit. At stations where this type is used, sample selection is simplified, as any cupful of peas is representative of the lot coming through the viner, and if several cupfuls are taken from the beginning, the middle, and the end of the load, a representative sample will be secured. In the older viners, the peas fall into boxes which are placed along the side of the unit. The more mature peas shell first and fall into the boxes at the front, while the tender ones usually fall into the boxes at the rear. Distribution of the peas is irregular, and for this reason a representative sample cannot be taken by occasionally taking a cupful from each box along the line, or by sampling a number of boxes throughout the load, as this may result in giving equal representation to a few boxes of high quality peas against a much larger number of poor quality, or vice-versa. Where this type viner is in use, the most satisfactory method is for the sampler to take a handful of peas from each box as it is taken from the viner. Usually the person attending the viner boxes can do this with very little inconvenience, simply taking a handful from each box as he stacks them. Another satisfactory method is the use of a portable canvas trough, long enough to extend from the front of the viner to the rear. At several times during the vining of the load, this trough is placed along the viner, catching a representative sample for that portion of the load.

- (14) Frequently it is impossible for the inspector to select his own sample. Where this condition exists, it will be permissible, with the consent of the supervising inspector, to have some designated and properly instructed person located at the viner to select the samples. It is the inspector's responsibility to frequently check with the sample taker to insure proper selection and identification of the samples and recording of the time of vining.

The size of the sample should of course be representative of the size of the load. Ordinarily, approximately 3 lbs. should be taken from a load. Except in sizing Alaska peas, only a portion of this sample is used in the actual inspection, and the inspector should thoroughly mix the sample before testing. Do not shake the peas, as this will result in the grouping of the larger ones. Frequently a number of samples will "pile up" ahead of the inspector, or he may be working with several samples at the same time, and care must be taken not to lose the identity of the sample. Do not carelessly destroy the unused part of the sample, but return it to the canner. (15)

GRADING PROCEDURE FOR ALASKA TYPE PEAS

As the size and texture of the Alaska type differs considerably from the Sweet type, it is necessary to vary the inspection procedure. In the Alaska type, U. S. Fancy peas are usually confined to the smaller sizes, and it is not desirable for the canner or the grower to try to meet the requirements of this grade. For this reason, the U. S. Fancy classification is usually omitted from the canner's contract with the grower. Where this is the case, the inspector will include with the U. S. No. 1 grade all U. S. Fancy peas. Also, in the Alaska type, the size is small, usually varying from No. 1 sieve size up to No. 5's and occasionally larger. Since grade percentages are calculated by count, although actually based on weight, it is necessary to size the peas on a mechanical grader furnished by the applicant. Approximately 3 lbs. or 50 ounces are sized in three groups, - 1 and 2 sieve size, 3 and 4 sieve size, and 5's and larger. Then the percentage in each group is calculated by weight. Some mechanical sizers separate the peas into only two groups (1, 2, and 3 serving as one group, and 4, 5 and larger as the second group). Where this is the case, the inspector will have to use caution in scoring on a count basis, making allowance for irregular sizes within the group. (16)

After separating the sample into the different size groups, 50 peas are selected at random from each. (Alaska type peas are not blanched before grading, as is the case with Sweet type peas). These peas are individually crushed between the fingers. The inspector judges the tenderness from the amount of pressure required to crush, the succulence from the amount of moisture in the cotyledon, and the presence of sugar and starch by the starchiness of the juice or the appearance of a "starch ball." When each specimen has been sorted, the grade of the group is figured, allowing 2% for each specimen. (17)

Normally, tenderness, succulence and sweetness run hand-in-hand; that is, a tender pea is also sweet and juicy, while a hard one is starchy and dry. Peas in the U. S. Fancy stage yield to slight pressure, and the inspector is able to completely crush the cotyledon into pulp. Moisture of a watery nature will practically flow from the pulp, and if the pulp or liquid is tasted, it will be sweet. When the maturity reaches the U. S. No. 1 stage, more pressure is required to crush, and instead of breaking down into a smooth pulp, the cotyledon (18)

will tend to remain in numerous pieces. Practically no moisture will exude from pressure and what does appear is sticky and becoming starchy. The sugar is beginning to turn to starch at this stage. In the U. S. No. 2 stage the peas are becoming hard and dry, and the sugar has practically all turned to starch. The cotyledon is dry and will only break into several pieces when crushed between the fingers. The edges will feel sharp, and the broken edges will appear dry and granular, with a starchy white appearance. U. S. No. 3 peas caused by over-maturity, are extremely dry and hard and have reached the seeding stage which can be noted by the appearance of a grayish film on the outer skin. In this stage it is almost impossible to crush the pea between the fingers.

(19) It can readily be seen that borderline peas, or peas with the maturity leaving one stage and entering another, will be difficult to place in the proper grade classification. However, if all the factors are taken into consideration, accurate results can be obtained. Taste is also a valuable aid in proper classification. But practice under supervision and a good general knowledge of peas are the best assets in accurately judging the dividing line of these grades.

(20) Explanation of various steps in arriving at the composite grade percentages in the example given below:

	1	2	3	4			5		
	: Wt. of : each		: Percent : of each	: Percent of various grades : in each Sieve Size Group			: Composite Grade : Percentage of each grade. (Peas in tot of all Sieve Size Groups equal 100 : Percent)		
Sieve Size	: Sieve : Size	: Sieve : Size	: Sieve : Size	: U.S. : No. 1	: U.S. : No. 2	: U.S. : No. 3	: U.S. : No. 1	: U.S. : No. 2	: U.S. : No. 3
1 & 2 Sieve	: 10 oz.	: 20%	: 100%	: 100%			: 20%		
3 & 4 "	: 25 "	: 50%	: 90%		10%		: 45%	5%	
5 & larger	: 15 "	: 30%	: 60%		30%	10%	: 18%	9%	3%
Totals	: 50 oz.	: 100%	:	Final grade			: 83%	14%	3%

(21) The total weight of the sample is exactly 50 ounces. After sizing, it is found that 10 ounces are 1 & 2 Sieve Size; 25 ounces are 3 & 4 Sieve, and 15 ounces are 5 Sieve and larger (see columns 1 and 2). Since 50 ounces is the gross sample, then each ounce equals 2 percent. Therefore, multiplying 10 ounces (column 2) of Sieve Size 1 & 2 group by 2, we find that 20 percent (column 3) of the 50 ounce sample is Sieve Size group 1 & 2. Similarly, the percentages of Sieve Size group 3 & 4 and Sieve Size group 5 group are obtained.

Next, 50 peas from Sieve Size group 1 & 2 are sorted into the various grades. The percentage of each grade is then computed by multiplying the number of peas in each grade by 2, and the percentage entered opposite the Sieve Size group 1 & 2 in column 4. Since all of these 50 peas are U. S. No. 1 or better, the percentage is 100 in column 4 under U. S. No. 1. The 50 peas from the 3 & 4 Sieve Size group are found to include 45 peas that are U. S. No. 1 or better and 5 which are of U. S. No. 2 grade, which, when multiplied by 2, gives the 90% shown under U. S. No. 1 and 10% under U. S. No. 2 in column 4. In the same manner, the percentage of each grade in Sieve Size group 5 is computed and entered in column 4. (22)

All the necessary figures are now on the certificate from which the composite grade of the 150 peas (50 peas of each Sieve Size group) may be calculated. The proportionate part or percentage of each grade found in the various Sieve Size groups is shown in column 4. That is, 100% or all of the peas, of Sieve Size 1 & 2 group are U. S. No. 1 grade. As only 20% (column 3) of the 50 ounce sample is in this Sieve Size group, this 20% is entered in column 5 under U. S. No. 1 grade. 90% of Sieve Size 3 & 4 group are U. S. No. 1's and 10% are U. S. No. 2's. One-half of the 50 ounce sample, or 50%, (column 3) are in this size group. Therefore 90% of this 50%, or 45%, are U. S. No. 1's and 10% of this 50%, or 5%, are U. S. No. 2's, which percentages are entered under their respective grade headings in column 5. The percentages of each grade in Sieve Size 5 and larger group are calculated in like manner. (23)

The final or composite grade is now obtained by adding the percentages under each of the grade headings shown in column 5, which total, 83% of U. S. No. 1, 14% U. S. No. 2, and 3% U. S. No. 3 grade peas in the 50 ounce sample. (24)

GRADING PROCEDURE FOR SWEET TYPE PEAS

Sweet peas are larger than those of the Alaska type and may remain in the U. S. Fancy stage until they are practically full sized. Because of this, the size is usually fairly uniform, and it is not necessary to divide the sample into different size groups. However, since percentage is calculated by count, it is sometimes necessary to make some allowance for size. U. S. Fancy sweets are firmer, while U. S. No. 2 may not appear as hard as the corresponding grades of Alaskas. Because of this narrower range in tenderness, inspection is made easier and much more accurate if the peas are blanched before testing. (25)

Blanching consists of placing approximately a six ounce sample in hot water of 200 degrees Fahrenheit for four minutes. The most practical method of blanching is by means of a live steam pipe with valve control extended into a drum or vat of water. With (26)

practice, the valve can be regulated to keep constant temperature of the water. The peas to be blanched are then placed in a mesh container (a No. 2 tin can, well perforated, is a good container) which is immersed in the water for exactly four minutes. Where inspectors are located at receiving stations and live steam is not available, electric hot plates are often used as a source of heat. However, they usually are not powerful enough to heat a large container of water, and the sample to be blanched must be reduced in size so that the temperature does not drop enough to affect the blanching. Where it is necessary to use small quantities of water, best results are obtained if the water is boiling before immersing the peas. Regardless of the type equipment, care should be used to secure a four minute blanch in water averaging 200 degrees Fahrenheit, as over or under cooking will affect the tenderness test and may cause inaccurate grading.

- (27) After blanching, the peas are immediately cooled in cold water, so that the peas do not continue to cook, thus affecting the tenderness. No attempt to grade the peas should be made until all heat from the blanching has disappeared.
- (28) From the blanched sample, select 50 peas at random. If there is a noticeable variation in quality, or if the test shows many borderline peas, the sample should be doubled. When the sample has been selected, the procedure is the same as for Alaskas, consisting of crushing to determine tenderness, succulence, starch, moisture and color.
- (29) When a U. S. Fancy pea is crushed, the cotyledon becomes a smooth mushy paste, green in color, and succulent. As the maturity reaches the U. S. No. 1 stage, the pulp is drier and becoming granular and gritty. At this stage the sugar is beginning to turn to starch. In the U. S. No. 2 stage, the cotyledon crushes under pressure, but remains chunky, and the pieces show very little moisture. Often a white center of "starch ball" has formed, and the edges of the cotyledon are becoming sharp. As a general rule, sweets are scored as U. S. No. 3 only when they have begun to shrivel or seed, or when they are defective because of scald, yellow color, etc. Under certain growing conditions, some peas may have to be scored as U. S. No. 3 grade because of extreme toughness or excess starch.

GRADE DEFECTS APPLICABLE TO BOTH TYPES OF PEAS

- (30) Any defects, such as rust, shriveling, embryonic development, or other blemishes, which injure the processing quality shall be scored against U. S. Fancy and U. S. No. 1 grades, and any defects which damage the canning quality shall be scored against the U. S. No. 2 grade. Minor blemishes which are practically unnoticeable shall not be regarded as injuring the canning quality. Blemishes which are not readily apparent shall be permitted in the U. S. No. 2 grade.

(31)

Heating and scald are serious defects which are caused by improper ventilation in the load or stack. In the heated stage, the peas have sweated, becoming sticky or slimy, and may become sour. In this stage it is impossible to tell which peas are affected. If the heating becomes serious, scald may develop, which is recognized by the appearance of sunken, faded or brown spots. All scalded peas should be scored as Culls. In many instances, it is questionable where to place the responsibility for the heated or scalded condition. Where it occurs, the inspector should grade the lot as accurately as possible, and write across the face of the certificate "Heated" or "Scalded."

Color is a factor of quality, yet in the grading process it is of secondary importance. All peas which are definitely off color for the corresponding grade should be scored. Color is often the deciding factor in the proper classification of borderline peas. (32)

In the U. S. Standards for Fresh Shelled Peas for Canning or Freezing, the definitions of injury or damage state that mechanical injury occurring from harvesting or vining shall not be scored against grade. Frequently the canner harvests the peas, and in practically all cases the viners are owned and operated by the canner. These operations are actually part of the canning process and any damage resulting from them should not be scored against the grower. (33)

Foreign Matter Not a Grade Factor.

The U. S. Standards state that thistle buds or other foreign matter shall not be considered as affecting any of the grades, but that restrictions regarding the amount of such foreign material may be fixed by agreement between grower and processor. In the absence of such an agreement, the inspector will ignore any foreign material in the peas so far as grades are concerned. However, he should remove all foreign material which would affect the weight of the sample used to determine percentages of various sieve sizes. (34)

If the amount of foreign matter is restricted by agreement between canner and grower, the amount of such foreign material should be noted on the certificate.

(35)

USE OF TENDERNESS METERS - (TENDEROMETER AND TEXTUREMETER) AS SUPPLEMENTAL TESTS

As stated above, tenderness is a primary factor of quality, and is probably the hardest for the inspector to judge, especially when he is fatigued. In order to get an accurate tenderness test, and also to serve as a guide to the inspector, a supplemental test is used on the inspection sample. This consists of the use of the Tenderometer or Texturemeter. Both machines are designed to register the force required to shear the peas. The Tenderometer, while being large and expensive, is fully automatic and the more accurate of the two. However, the small and convenient Texturemeter, while

somewhat erratic, gives satisfactory results if the following procedure is followed. (1) Check fluid in the cylinder; it should be slightly less than level full, and never above level. (2) Occasionally check shearing prongs; they should not bind on the openings of the cup. (3) Always fill cup to the capacity; peas should just touch top cover when in place. (4) Always turn crank at same moderate speed, fast and firm enough to carry over any uneven spots at a constant speed. (5) Use at least three tests on each sample, and disregard any extremely high or low readings, averaging at least three for the final reading. (6) Occasionally have machine tested.

(36) The sample to be mechanically tested is selected from the composite sample, which should first be thoroughly mixed. Any foreign material should be eliminated, as it will cause an inaccurate reading, as well as possible damage to the machine. After testing, record the pressure and by means of the charts shown on pages 16 and 17, convert the reading into grades. For example, a tenderometer reading for Alaska type peas was 142 which indicates a grade average of 67% U. S. No. 1 and 33% U. S. No. 2, and which might vary according to the grade range, which is from 72% U. S. No. 1 and 27% U. S. No. 2 and 1% U. S. No. 3 to 61% U. S. No. 1 and 39% U. S. No. 2.

(37) It will be noticed that the Conversion Charts end with a reading of 200, as this is the top of the scale for the Texturemeter. Occasionally the inspector will find a lot of peas which would register higher, but the Texturemeter should be stopped before passing the "Danger" mark. Tenderometers record as high as 250, and have safety releases at this point. Where actual readings would exceed the 200 mark, hard peas of poor quality are indicated, and the inspector will judge the peas accordingly.

COMBINING RESULTS - FINAL GRADE

(38) As mentioned above, the results of the supplemental tests must be taken into consideration in determining the final grade, as the mechanical test of tenderness, a primary factor of grade, is more accurate than judging the amount of pressure required to crush the peas between the fingers. Moreover, in a sample containing a considerable amount of marginal peas, experienced inspectors are likely to vary in their results, and this can be overcome by comparing the results with readings of a mechanical device. In arriving at the final grade, no definite policy of adjustment can be established. Certain unusual growing conditions may cause tough skins or excess moisture, in which cases the tenderness meter may indicate grades lower than the actual grade. Likewise, the tenderometer may indicate higher grades than is actually the case due to the fact that it does not register yellow, shriveled, heated or otherwise defective peas. The inspector must take all of the facts into consideration, and adjust the grade according to his judgment. U. S. No. 3 peas which are scored because of defects must remain constant in the final grades.

In determining the final grade, certain rules should be followed, provided no unusual conditions have been noticed. If the results of the individual inspection fall within the grade range indicated by the tenderness meter, both tests are fairly accurate, and since tenderness is probably the most important factor it is advisable to average together the grade from the individual inspection and the "grade average" indicated by the tenderometer. Where the individual inspection does not fall within the grade range, it is necessary to carefully recheck the inspection. If the results still do not fall within the grade range and no unusual conditions are noted, the results should likewise be averaged. If the inspector is able to determine the cause for any variation, he should adjust the final grade according to his judgment, taking into consideration the quality factors in order of their importance; that is, defects, tenderness, starch content, moisture, and color. When wide variations from the conversion charts occur frequently, the inspector should consult his supervisor. (39)

THE INSPECTION CERTIFICATE PRIMA FACIE EVIDENCE

This is such evidence as will be sufficient for proof of a particular fact until contradicted and overcome by other evidence. In one of the decisions of the Supreme Court of the United States, that court, speaking of prima facie evidence, said that the jury was bound to consider it in that light and that no judge would hesitate to set aside their verdict and grant a new trial if, under such circumstances, without any rebutting evidence, they disregarded it. The Federal Food Products Inspection Law provides that certificates issued by authorized agents of the Department shall be received in all courts of the United States as prima facie evidence of the truth of the statements contained therein. (40)

THE CERTIFICATE

Carefulness in Recording Data.

The certificate must be easily legible. All data set down during the process of inspection should be complete and clear. All computations should be checked carefully. Inspectors will be held responsible for figures being legible on the last carbon of the certificate. (41)

Correcting and Voiding Certificates.

If corrections are not conspicuous, minor mistakes which would not affect the credibility of the certificate if presented in court may be changed by crossing out the part in error and inserting the correct information. No corrections should be made on any certificate unless the inspector has all copies in his possession so that all corrections may be made at the same time. Whenever an error has been discovered and the inspector does not have all copies of the certificate, he should issue a new certificate upon which the following statement should be made: "This certificate supersedes certificate No. _____." (42)

- (43) No attempt should be made to erase errors on certificates. All corrections should be initialed.

Certificate Number

- (44) Certificates are numbered serially and every certificate should be accounted for. If a certificate is spoiled in preparation write "cancelled" across the original and each copy and leave in the pad.

Names of Place, Canner, Grower, and Date.

- (45) The name of the place where the inspections are to be made and the name of the canner should be stamped or written on a large number of certificates before the inspection work begins.
- (46) The grower's name and the date and hour should be filled in at the time of inspection. However, there is no objection to dating a large number of certificates provided no more are dated than will be used the same day. The time should be filled in to the nearest half-hour. Where a grower delivers several loads in a day, the hour of inspection serves as an identifying mark. In cases where viner units are located at out-lying points, show also the time of vining, such as "8 A. M.," the first hour indicating the time of sample selection and the second the inspection time. This is important, particularly in the case of heated peas or in variations of different loads of the same grower.
- (47) The date entered on the certificate shall be the date upon which the actual inspection is made, and not the day the peas are delivered.

Load Number

- (48) Cannery often furnish ticket numbers for growers' loads. This ticket number should be entered in the upper right-hand corner above the certificate number.

Products Inspected and Number of Containers

- (49) Under this heading indicate whether "Alaska Peas" or "Sweet Peas." Where the canner furnishes the name of the variety, it should be entered, as "Sweet Peas-Laxton." If peas are delivered in boxes from a vining station, the number of containers should be entered in the space provided.

Recording Tenderness Readings

- (50) In the upper left-hand corner of the certificate record the tenderometer or texturemeter reading, such as "T-191." The canner frequently desires this information. It is also valuable for future reference.

Distribution of Certificate Copies

The original certificate is issued to the party who requests the inspection. This is usually the canner. One copy of the certificate is issued to the grower, and one copy is retained for office records. (51)

Procedure in Reporting Second Inspections

Second inspections may be requested when the accuracy of the original report has been questioned. Always mark the time of second inspections on the certificate. (52)

If the second inspection is made within a reasonable time of the first inspection, the results of both inspections should be averaged and a new certificate issued. The following statement should be written on the certificate "This certificate supersedes certificate No. _____." (53)

If a considerable period of time has elapsed since the first inspection was made, and the second inspection shows a more advanced stage of maturity than was reported on the original certificate, a new certificate based only upon the results of the second inspection should be issued. This new certificate should be marked "Second Inspection." If, however, the second inspection shows an earlier stage of maturity than was reported on the original certificate, it is obvious that either an error had been made or that the sample of peas was not representative of the whole lot. If it is apparent that an error had been made, only the results of the second inspection should be reported on a new certificate. If it appears evident that the original sample of peas was not representative of the lot, the results of both inspections should be averaged. In either case, the following statement should be written on the certificate: "This certificate supersedes certificate No. _____." (54)

The interpretation of a "reasonable length of time" between inspections is governed not only by the actual time, but weather conditions and the effect of ventilation or lack of ventilation upon the peas should be considered. For example, the effect on maturity would be greater on a hot day than on a cool one. (55)

Signature on Certificates

The inspector shall sign his full name, or the initials of his given names and his last name in full. Nicknames should never be used. This warning is given because some new inspectors have either used only their initials or simply their last names on certificates. Legally, either of these signatures would be worthless, and the certificate "thrown out" of court. (56)

Care of Certificates

- (57) Inspectors should take necessary precautions to prevent blank certificates from falling into the hands of persons who have no right to use them. No person shall be allowed to sign the certificate except one who has been licensed by a Federal Supervisor.
- (58) Each inspector will be held responsible for the return of all unused certificates to his supervising inspector at the close of the season.
- (59) During the season, copies of completed certificates shall be kept in numerical order where they may be readily available whenever any financially interested party or the supervising inspector desires to see them. These certificates shall be returned to the supervisor at the close of the season.

Results of Inspections are Confidential

- (60) Inspectors must not give out information to growers or to competitor canners regarding the results of inspections of individual grower's lots or the general quality of peas delivered to the cannery. Statements in which comparisons are made of quality of various growers' lots sometimes prove very embarrassing.

MISCELLANEOUS INSTRUCTIONS

- (61) In the past, some inspectors have been guilty of overlooking or disregarding small or seemingly unimportant instructions. This ultimately has caused trouble which could have been prevented. Following are a few "pointers" which should be kept in mind throughout the entire season:

1. Refer to Handbook frequently. Always check with the conversion chart before making final grade decisions.
2. Take T-meter tests accurately.
3. Thoroughly mix the large sample of peas before securing the smaller inspection sample.
4. Make certain the sample is properly blanched and do not grade until thoroughly cooled.
5. When selecting sample to be crushed, do not pour 50 peas from blanching cup. Place entire blanched sample on a plate or tray and take 50 representative peas.

6. While crushing peas for grade, frequently rinse fingers in water. Do not allow them to become "gummed up" as this will interfere with your judgment.

7. Have the inspection procedure well organized. This will save time and trouble, as well as making the job easier.

8. Cooperate with the canner and grower as much as possible since inspection is a service to both.

9. If necessary, do not hesitate to call your Supervisor.

EQUIPMENT REQUIRED

1. Mechanical sizer, for Alaskas only. (62)
2. Blanchers for sweets. See paragraph 26.
3. Cooling vat, or bucket.
4. Blanching cups. Any mesh container holding a sufficient sample and allowing good circulation is satisfactory. No. 2 cans well perforated, and with wire handles are commonly used. Several are needed, depending upon the volume of work.
5. Available water supply.
6. Containers for samples. No. 10 cans, 5 lb. waxed cartons, etc., the number needed depending on the number of viners and the location of the inspector.
7. Paper towels or several cloth towels.
8. Scratch paper (old labels) for identifying lots and computing percentages.
9. Percentage slide rule for use on Alaskas.
10. Work bench.
11. Inspection memorandums.

CONVERSION CHART FOR ALASKA TYPE PEAS

(63) T-Meter Reading	GRADE AVERAGE			GRADE RANGE		
	U.S.No. 1	U.S.No.2	U.S.No.3	U.S.No.1	U.S.No.2	U.S.No.3
Below 95	Generally 100% U. S. No. 1 or better					
95 - 100	98%	-	2%	-	0	0
				100%	-	0
				77%	-	5
					-	0
101 - 105	92	-	8	-	0	0
				97	-	3
				87	-	13
					-	0
106 - 110	87	-	13	-	0	0
				92	-	8
				82	-	18
					-	0
111 - 115	83	-	17	-	0	0
				88	-	12
				77	-	23
					-	0
116 - 120	80	-	20	-	0	0
				85	-	15
				74	-	26
					-	0
121 - 130	75	-	25	-	0	0
				80	-	20
				69	-	31
					-	0
131 - 140	71	-	29	-	0	0
				75	-	25
				66	-	34
					-	0
141 - 150	67	-	33	-	0	1
				72	-	27
				61	-	39
					-	0
151 - 160	63	-	37	-	0	2
				69	-	29
				56	-	44
					-	0
161 - 170	58	-	41	-	1	4
				64	-	32
				50	-	50
					-	0
171 - 180	52	-	46	-	2	6
				58	-	36
				43	-	57
					-	0
181 - 190	45	-	51	-	4	8
				52	-	40
				37	-	63
					-	0
191 - 200	37	-	57	-	6	10
				46	-	44
				30	-	68
					-	2

NOTE: Readings of over 200 indicate hard peas of low quality which should be graded accordingly.

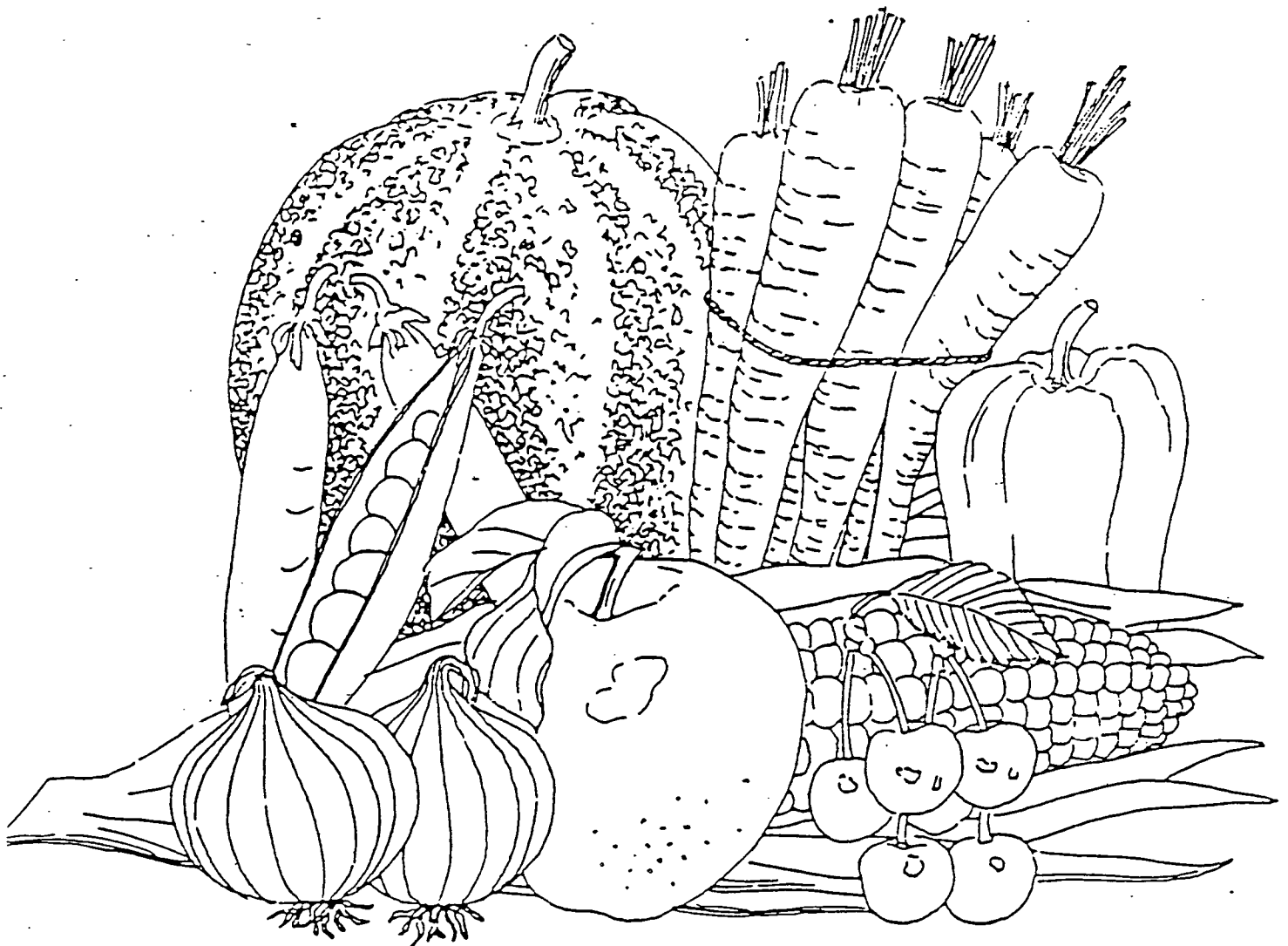
CONVERSION CHART FOR SWEET TYPE PEAS

T-Meter Reading	GRADE AVERAGE				GRADE RANGE				(64)
	U. S. FANCY	U. S. NO. 1	U. S. No. 2	U. S. No. 3	U. S. FANCY	U. S. No. 1	U. S. No. 2	U. S. No. 3	
Under 95	Generally 100% Fancy								
96 - 100	97	- 3	- 0	- 0	100	- 0	- 0	- 0	
					93	- 7	- 0	- 0	
101 - 105	91	- 9	- 0	- 0	95	- 5	- 0	- 0	
					86	- 14	- 0	- 0	
106 - 110	85	- 15	- 0	- 0	90	- 10	- 0	- 0	
					80	- 20	- 0	- 0	
111 - 115	80	- 20	- 0	- 0	85	- 15	- 0	- 0	
					75	- 25	- 0	- 0	
116 - 120	75	- 25	- 0	- 0	79	- 21	- 0	- 0	
					70	- 30	- 0	- 0	
121 - 125	70	- 30	- 0	- 0	75	- 21	- 4	- 0	
					66	- 34	- 0	- 0	
126 - 130	65	- 33	- 2	- 0	72	- 22	- 6	- 0	
					60	- 40	- 0	- 0	
131 - 135	60	- 36	- 4	- 0	68	- 24	- 8	- 0	
					54	- 44	- 2	- 0	
136 - 140	55	- 39	- 6	- 0	62	- 26	- 12	- 0	
					48	- 52	- 0	- 0	
141 - 145	49	- 42	- 9	- 0	56	- 30	- 14	- 0	
					38	- 58	- 4	- 0	
146 - 150	44	- 44	- 12	- 0	52	- 30	- 18	- 0	
					36	- 58	- 6	- 0	
151 - 155	38	- 47	- 15	- 0	47	- 31	- 22	- 0	
					30	- 62	- 8	- 0	
156 - 160	33	- 49	- 18	- 0	42	- 33	- 25	- 0	
					24	- 68	- 8	- 0	
161 - 165	28	- 50	- 22	- 0	36	- 36	- 28	- 0	
					20	- 67	- 13	- 0	
166 - 170	23	- 52	- 25	- 0	35	- 32	- 29	- 4	
					16	- 70	- 14	- 0	
171 - 180	14	- 54	- 30	- 2	28	- 34	- 32	- 6	
					5	- 67	- 28	- 0	
181 - 190	4	- 56	- 36	- 4	12	- 31	- 35	- 12	
					0	- 62	- 36	- 2	
191 - 200	0	- 52	- 40	- 8	5	- 38	- 42	- 15	
					0	- 58	- 38	- 4	

NOTE: Readings of over 200 indicate hard peas of low quality which should be graded accordingly.

Appendix I

United States Standards



**UNITED STATES STANDARDS FOR GRADES OF
FRESH SHELLED PEAS FOR CANNING OR FREEZING¹**

Effective January 15, 1946

Source: 32 F.R. 8873, June 22, 1967

Sec.	GENERAL
51.4210	General.
	GRADES
51.4211	U.S. Fancy.
51.4212	U.S. No. 1.
51.4213	U.S. No. 2.
51.4214	U.S. No. 3.
	CULLS
51.4215	Culls.
	FOREIGN MATERIAL
51.4216	Foreign material.
	DEFINITIONS
51.4217	Very tender.
51.4218	Very succulent.
51.4219	Good characteristic color.
51.4220	Injury.
51.4221	Fairly tender.
51.4222	Fairly succulent.
51.4223	Characteristic color.
51.4224	Slightly tender.
51.4225	Slightly succulent.
51.4226	Green color.
51.4227	Damage.

AUTHORITY: The provisions of this subpart issued under secs. 203, 205, 60 Stat. 1087, as amended, 1090 as amended; 7 U.S.C. 1622, 1624.

GENERAL

§ 51.4210 General.

(a) These standards are recommended to be used as a basis for contracts only after thorough consideration by canners and growers, and preferably after demonstration of methods of grading and inspection by qualified inspectors. They provide a basis for determining the quality of various lots of peas after shelling. The standards are an outgrowth of the widely accepted principle that price should be proportional to quality. The grower delivering high quality peas deserves a commensurate price because such quality peas enable the canner to pack a better quality finished product.

¹Packing of the product in conformity with the requirements of these standards shall not excuse failure to comply with the provisions of the Federal Food, Drug, and Cosmetic Act or with applicable State laws and regulations.

(b) Inspection based upon the U.S. Standards for Fresh Shelled Peas for Canning or Freezing involves securing a representative sample from each lot and classifying each of the individual peas in accordance with the accompanying grades. The inspector's report shows the percentage of peas in each of the various grades.

(c) The application of the standards requires the services of private or official inspectors. Such inspectors must be capable, efficient, and above all, they must be absolutely impartial.

GRADES

§ 51.4211 U.S. Fancy.

"U.S. Fancy" consists of peas of similar varietal characteristics which are very tender, very succulent, of good characteristic color; free from decay, scald, and from injury caused by rust, shriveling, heating, disease, insects, or other means.

§ 51.4212 U.S. No. 1.

"U.S. No. 1" consists of peas of similar varietal characteristics which are fairly tender, fairly succulent, of characteristic color, free from decay and scald, and from injury caused by rust, shriveling, heating, disease, insects, or other means.

§ 51.4213 U.S. No. 2.

"U.S. No. 2" consists of peas of similar varietal characteristics which are slightly tender, slightly succulent; which have a green color and are free from decay and scald, and from damage caused by rust, shriveling, heating, disease, insects, or other means.

§ 51.4214 U.S. No. 3.

"U.S. No. 3" consists of peas which are free from decay, scald, and from damage caused by heating, or other means.

CULLS

§ 51.4215 Culls.

"Culls" are peas which fail to meet the requirements of U.S. No. 3 grade.

FOREIGN MATERIAL

§ 51.4216 Foreign material.

The presence of thistle buds or other foreign material shall not be considered as affecting any of the foregoing grades. However, restrictions regarding the amount of such foreign material may be fixed by agreement between grower and processor.

DEFINITIONS

§ 51.4217 Very tender.

"Very tender" means that the pea yields to slight pressure and the cotyledon crushes into a smooth pulp.

§ 51.4218 Very succulent.

"Very succulent" means that the pea tastes sweet, and the cotyledon yields free juice when crushed.

§ 51.4219 Good characteristic color.

"Good characteristic color" means that the pea has good green color characteristic of the variety.

§ 51.4220 Injury.

"Injury" means any defect, or any combination of defects, which detracts from the canning or freezing quality. Mechanical injury incident to harvesting and vining operations shall not be considered as injury.

§ 51.4221 Fairly tender.

"Fairly tender" means that the pea yields to moderate pressure which causes the cotyledon to break into numerous small granular pieces rather than to crush into a smooth pulp.

§ 51.4222 Fairly succulent.

"Fairly succulent" means that the pea is moist and fairly sweet.

§ 51.4223 Characteristic color.

"Characteristic color" means that the pea has a fairly good green color; that is, not faded or having a yellowish color.

§ 51.4224 Slightly tender.

"Slightly tender" means that the pea yields to pressure between the thumb and finger but the edges of the cotyledon feel rather hard and sharp and the edges of broken pieces appear whitish and ragged.

§ 51.4225 Slightly succulent.

"Slightly succulent" means that the pea is becoming dry and starchy, and often having a whitish center or "starch ball."

§ 51.4226 Green color.

"Green color" means that the pea may be slightly yellowish or faded, but the green color is predominant.

§ 51.4227 Damage.

"Damage" means any defect, or any combination of defects, which materially detracts from the canning or freezing quality of the pea. Mechanical injury incident to harvesting and vining operations shall not be considered as damage.

This is a reissue of U.S. Standards for Grades of Fresh Shelled Peas for Canning or Freezing which were effective January 15, 1946. No substantive change is made in the text of the standards.