

SUNFLOWER SEED (CLASSIFICATION AND GRADING) REGULATIONS

(under section 19)

(18th February, 1977)

ARRANGEMENT OF REGULATIONS

REGULATION

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S.I. 16, 1977.

1. Citation

These Regulations may be cited as the Sunflower Seed (Classification and Grading) Regulations.

2. Interpretation

In these Regulations, unless the context otherwise requires-

"castor seed" means the seed of the plant *Ricinus* spp;

"consignment", in relation to sunflower seed, means a quantity of sunflower seed of the same class and grade delivered at any one time under cover of the same consignment note, delivery note or receipt note or from the same vehicle, or, if any quantity is divided into different cultivars, each quantity of the different cultivars;

"damaged sunflower seed" means-

- (a) sunflower seed which has been damaged by insects;
- (b) sunflower seed which is visibly infected with mould organisms or other fungi;
- (c) sunflower seed or pieces of sunflower seed which have been distinctly discoloured by external heat or as a result of heating caused by internal fermentation in seed with a high moisture content;
- (d) sunflower seed in which germination or sprouting has proceeded to such an extent that the hull thereof has been broken as a result of the development of the embryo; or
- (e) sunflower seed of which the hulls have been broken or of which the hulls were opened in any way or which are partly decorticated;

"decorticated sunflower seed" means sunflower seed of which the hulls have been completely removed;

"foreign matter" means all material other than sunflower seed, including loose hulls of sunflower seed;

"insects" means the grain weevil (*Sitophilus granarius* Linn.), the rice weevil (*Sitophilus oryzae* Linn.) or the Angoumois grain moth (*Sitotroga cerealella* Oliv.);

"sunflower seed" means the fruit (*Cypsela*) of the plant *Helianthus annuus*.

3. Application

These Regulations shall apply to sunflower seed sold by producers to or through the Board.

4. Classification and grading

(1) For grading purposes sunflower seed is classified as follows-

- (a) Class FH, which consists of the dull coloured, thin shelled, high-in-oil sunflower seed; and
- (b) Class F, which consists of clearly striped and shiny black sunflower seed.

(2) Subject to the provisions of subregulation (4), the grades for sunflower seed shall be-

- (a) FH1 and FH2 for Class FH; and
- (b) F1 and F2 for Class F.

(3) Subject to the allowable deviations prescribed in subregulation (5), the specifications for the different grades of sunflower seed are as follows-

| Quality factor | Grade | | | |
|--|-------|-------|----|----|
| (a) Damaged seeds | | | | |
| (b) Decorticated seeds | | | | |
| (c) Foreign matter | | | | |
| (d) Mouldy, khaki bush or other objectionable odour | | | | |
| (e) Maximum percentage moisture | | | | |
| (f) Chemical substances which render the sunflower seed unsuitable for commercial purposes | | | | |
| (g) Live insects | | | | |
| (h) Castor seed or other poisonous seeds | | | | |
| (i) The mass expressed as kg per hl (minimum) | 2,4 | ,7 | ,9 | ,2 |
| (j) Other classes of sunflower seed ... | vii* | viii* | | |

(4) Sunflower seed which does not comply with the specifications as prescribed in subregulation (3) shall be graded as Undergrade.

(5) Maximum percentage allowable deviations-

| Quality factor | Grade | | | |
|------------------------------|-------|--|-----|----|
| (a) Damaged seeds | | | | |
| (b) Decorticated seeds | | | | |
| (c) Foreign matter | | | ix* | x* |
| (d) Other classes | | | | |

5. Methods of sampling

For the purposes of these Regulations a random sample shall be drawn as follows-

- (a) *Out of bags:* Samples for the testing of sunflower seed in bags shall be obtained by taking more or less equal quantities by hand or by means of a tubular probe or a grain probe from the bags to be graded. If the sample is taken by hand, not less than five percent of the bags taken at random from all the bags in a consignment shall be opened. If, however, the sample is taken by means of a tubular probe, at least five percent of the bags, taken at random, shall be removed from the consignment and a tubular probe inserted at one or more places at the mouth of the bag for the full length of the bag. When the sample is taken by means of a grain probe, each bag shall be probed at different levels and probing shall in all cases be done towards the centre of the bags. If the sunflower seed from all the bags in a consignment is found to be

generally of the same quality, the samples from all the bags shall be thrown together and thoroughly mixed.

- (b) *When delivered in bulk:* Samples shall be taken by means of a tubular probe. The tubular probe shall be inserted in at least four places for the whole depth of the bulk trailer or vehicle bed. Samples thus obtained shall be thrown together and thoroughly mixed.
- (c) *Deviation samples:* If a grader should notice during the course of taking the random sample that the quantities of sunflower seed taken from any container are obviously inferior to that taken from the remainder of the containers, he shall take a separate random sample out of the containers containing such inferior sunflower seed. This sample shall be thoroughly mixed and shall for the purposes of these Regulations be regarded as a deviating sample. The bags from which the deviating samples have been drawn shall be placed aside and graded separately.

6. Determination of percentage deviations

- (1) The percentage of damaged sunflower seed shall be determined as follows-
 - (a) measure out duplicate samples of 50 g each from either the random or deviating sample, as the case may be;
 - (b) sort out by hand or separate by means of sieves in such a manner that the damaged sunflower seed is retained;
 - (c) determine the mass of the damaged sunflower seed and express as a percentage of the mass of the sample; and
 - (d) if the difference between the percentages so determined in respect of the two samples does not exceed 0,5, the average of the two percentages so determined shall be taken. If the difference exceeds 0,5, the test shall be repeated.
- (2) The percentage of decorticated sunflower seed shall be determined as follows-
 - (a) measure out duplicate samples of 50 g each from either the random or deviating sample, as the case may be;
 - (b) sort out by hand or separate by means of sieves in such a manner that the decorticated sunflower seed is retained;
 - (c) determine the mass of the decorticated sunflower seed and express as a percentage of the mass of the sample; and
 - (d) if the difference between the percentages so determined in respect of the two samples does not exceed 0,5, the average of the two percentages so determined shall be taken. If the difference exceeds 0,5, the test shall be repeated.
- (3) The percentage of foreign matter shall be determined as follows-
 - (a) measure out duplicate samples of 50 g each from either the random or deviating sample, as the case may be;
 - (b) sort out by hand or by means of sieves in such a manner that the foreign matter is retained;
 - (c) determine the mass of the foreign matter and express as a percentage of the mass of the sample; and
 - (d) if the difference between the percentages so determined in respect of the two samples does not exceed 0,5, the average of the two percentages so determined shall be taken. If the difference exceeds 0,5, the test shall be repeated.

7. Determination of mass in kg per hl

- (1) The mass in kg per hl shall be determined by the two-level funnel four-in-one scale method.
- (2) A portion of the random or the deviating sample, as the case may be, is used for this purpose.
- (3) The standard apparatus in this method is the following-
 - (a) a four-in-one scale;

- (b) a bucket, internal height 124 mm, capacity 500 ml;
- (c) a two-level funnel, top diameter 914 mm, diameter of shutterhole 285 mm;
- (d) the funnel to be attached to a metal base by means of a cylindrical metal upright;
- (e) the high level is used in the case of sunflower seed; and
- (f) a wooden scraper, 10 mm thick, 40 mm wide and at least 100 mm long, the edges of the scraper shall be well rounded, but not worn.

(4) Method of using apparatus:

The entire apparatus is placed or fastened on to a hard, smooth, level surface not subject to jarring or shaking. The funnel is filled with sunflower seed and scraped off level full. The bucket is then placed on the high level of the base of the stand. The funnel shutter is opened wide with a quick swing, the sunflower seed being allowed to fill the bucket and to overflow on all the sides. The funnel is then swung round away from the bucket without disturbing the bucket in any way. The surplus sunflower seed is then scraped from the bucket with the scraper which is held vertically. If the scraper has both a round and sharp edge, only the round edge may be used for scraping. In scraping the scraper is placed lightly but firmly on the rim of the bucket which is grasped gently but firmly with one hand and the surplus sunflower seed scraped off with one firm scrape straight across the rim of the bucket. The scraping should leave the bucket just level full of sunflower seed. The four-in-one-scale is placed on a firm base and balanced. The sunflower seed in the bucket is then poured into the pan of the four-in-one-scale and the mass determined in kg per hl. The determination shall be done twice with each sample and if the readings do not correspond, the test shall be repeated with a new sample.

8. Determination of moisture content of sunflower seed

(1) The moisture content shall be determined by the Marconi electrical resistance method.

(2) A random or deviating sample, as the case may be, of at least 30 g and not more than 40 g of sunflower seed from which the foreign matter has been removed, shall be taken.

(3) The standard apparatus is the following-

- (a) a Marconi moisture meter Model TF933 or TF933A;
- (b) a coffee mill or Alexander Work 466 mill or Philips electrical mill, or any other suitable mill; and
- (c) a glass jar with a screw top and with a capacity of at least 350 ml and not exceeding 450 ml.

(4) Grinding of the sample: Grind the sample of sunflower seed, obtained as prescribed in subregulation (2), as follows-

- (a) the mill shall be operated at a uniform speed;
- (b) the milled portions shall be in a granulated form of uniform size;
- (c) to obtain this degree of fineness the milling plates must be set as tightly as possible by means of the adjusting screw and then by loosening the latter by about one quarter turn;
- (d) the milling process shall last one minute with 10 seconds pause after each 15 seconds; and
- (e) the milled product shall immediately be transferred to the glass jar and after the lid has been screwed on properly the contents shall be thoroughly mixed by shaking the jar for at least 30 seconds.

(5) Method of determining the moisture content:

Immediately after the sample mentioned in subregulation (4) is ready, the test cell of the Marconi apparatus shall be filled approximately half full with the milled sample and the metal plunger shall be placed into position on it. Care shall be taken to ensure that the surface of the sample is level in the cell and that the parts of the cell fit properly into one another. The cell shall be handled only by the outer insulating material surrounding it. Immediately thereafter the cell

(with the metal plunger facing upwards) shall be fitted into the clamp which forms part of the Marconi apparatus and screwed tight until the two parts of the cylindrical spring housing mounted on the screw are flush. The clamp containing the cell shall have proper electric contact with the main apparatus. The switch shall now be turned to the "zero" position and the galvanometer pointer shall thereafter be adjusted by means of the "set-zero" knob above the dials until the pointer is exactly opposite the horizontal line. When setting to "zero" the left-hand dial shall be at any one of the positions 1 to 5. The switch shall then be turned to the "Read" position and the dials immediately adjusted until the galvanometer pointer returns to the position of the horizontal line. The dial reading shall now be taken and the temperature be read to the nearest degree, from the thermometer attached to the main apparatus. Any gradual movement of the pointer, after having been correctly adjusted, shall be disregarded. Not more than one minute shall elapse between the placing of the samples into the cell and the taking of the final dial reading. Where possible, readings shall only be taken on the black or positive value of the dials. Dial readings shall be converted into percentages according to the following table-

| <i>Dial reading</i> | <i>Percentage moisture</i> | <i>Dial reading</i> | <i>Percentage moisture</i> |
|---------------------|----------------------------|---------------------|----------------------------|
| 0 | 4,46 | 28 | 8,33 |
| 1 | 4,56 | 29 | 8,52 |
| 2 | 4,67 | 30 | 8,71 |
| 3 | 4,77 | 31 | 8,91 |
| 4 | 4,88 | 32 | 9,11 |
| 5 | 4,98 | 33 | 9,32 |
| 6 | 5,10 | 34 | 9,53 |
| 7 | 5,21 | 35 | 9,74 |
| 8 | 5,33 | 36 | 9,96 |
| 9 | 5,45 | 37 | 10,19 |
| 10 | 5,57 | 38 | 10,42 |
| 11 | 5,70 | 39 | 10,65 |
| 12 | 5,83 | 40 | 10,89 |
| 13 | 5,96 | 41 | 11,14 |
| 14 | 6,10 | 42 | 11,40 |
| 15 | 6,23 | 43 | 11,65 |
| 16 | 6,37 | 44 | 11,91 |
| 17 | 6,52 | 45 | 12,18 |
| 18 | 6,66 | 46 | 12,46 |
| 19 | 6,82 | 47 | 12,74 |

| | | | |
|----|------|----|-------|
| 20 | 6,97 | 48 | 13,02 |
| 21 | 7,12 | 49 | 13,32 |
| 22 | 7,29 | 50 | 13,62 |
| 23 | 7,45 | 51 | 13,93 |
| 24 | 7,62 | 52 | 14,24 |
| 25 | 7,79 | 53 | 14,56 |
| 26 | 7,97 | 54 | 14,89 |
| 27 | 8,15 | 55 | 15,23 |

The result thus obtained shall be corrected for temperature by increasing it by 0,1 for each degree Centigrade the temperature reading is below 20° Centigrade and by decreasing it by 0,1 for each degree Centigrade the temperature is above 20° Centigrade.

The test shall be carried out in duplicate without interruption, with separate quantities of the original milled sample and if the two results thus obtained do not differ by more than 0,3 the average of the two results shall be taken as the percentage moisture content of the sunflower seed from which the sample was taken. If the results of the two determinations differ by more than 0,3 the determination shall be repeated with further quantities of the original milled sample until two results are obtained which do not differ by more than 0,3.

Care shall be taken that the mill used for the grinding of the sample, the jar used for mixing the sample and the pressure cell of the apparatus are clean and dry before each determination is commenced. The moisture meter has to be in equilibrium with the temperature of the ambient air in order to obviate the generation of thermo-electric currents in the instrument which may cause errors in the dial reading. For this reason it is imperative that the moisture meter shall remain in one position for an appreciable time before a moisture test is carried out. If for some special reason the moisture meter has to be moved to another position or some other locality, it shall be left undisturbed for at least one hour in the new position to allow the instrument to come into thermal equilibrium with the ambient air before a moisture test is carried out. If it is not possible to affix the thermometer to the case of the instrument, it shall be placed in a convenient horizontal position on top of the apparatus at least 15 minutes before a moisture test is started. In those cases where the thermometer can be affixed to the apparatus but does not remain in that position permanently, it shall be placed in that position at least 15 minutes before commencement of a moisture test.

When a moisture determination is made by means of this method, care shall be taken that the apparatus is in good working order by short circuiting the two top-most sockets on the main apparatus with a short piece of wire and turning the switch to "zero" and adjusting the galvanometer pointer until it is opposite the horizontal line. After the switch has been returned to "Read" the reading on the dials, taken in the manner prescribed above, shall be approximately 60. The wire shall then be removed. Thereafter the clamp shall be connected electrically with the main apparatus as prescribed, the switch turned to "zero", the galvanometer pointer adjusted to the position opposite the horizontal line and the base of the test cell kept in its normal position in the clamp. A piece of metal wire or silver paper (tin foil) shall be placed across the exposed electrodes (the metal parts) of the test cell and pressed down to cause a short circuit. After the switch has been turned to "Read" the dial reading, taken in the manner prescribed, shall be approximately 60. Thereafter the base and the insular ring of the test cell shall be placed in the clamp and screwed down without the plunger until they just fit tightly, the

switch turned to "zero" and the galvanometer pointer adjusted to the position opposite the horizontal line. After the switch has been turned to "Read" the reading on the dials in this instance would be nil or lower but, if the reading is higher than nil, the base of the test cell may be exposed to sunlight or reasonably warm air for a few minutes after which the test shall be repeated.

(6) *Cleaning of test cell:* It is essential that the test cell shall be thoroughly cleaned after each moisture determination as follows-

- (a) for readings below 40-rub the test cell thoroughly clean with a clean, dry cloth; and
- (b) for readings above 40-clean the test cell thoroughly with undiluted "Teepol" or other cleansing medium and dry thoroughly with a clean, dry cloth.

(7) After the test cell has been cleaned it shall be left for at least two minutes to ensure that no moisture has adhered to it and also to let the temperature of the test cell return to normal.

(8) *Cleaning of mill:* After the samples of sunflower seed have been ground, the mill must be thoroughly cleaned, using "Teepol" or other cleansing medium and rubbed dry with a clean, dry cloth.

ⁱDenotes no maximum.

ⁱⁱDenotes no maximum.

ⁱⁱⁱDenotes no maximum.

^{iv}Denotes no maximum.

^vDenotes no maximum.

^{vi}Denotes no maximum.

^{vii}Denotes no specification.

^{viii}Denotes no specification.

^{ix}Denotes no specification.

^xDenotes no specification.