CHAPTER 345

THE FERTILIZERS AND ANIMAL FOODSTUFFS ACT

SUBSIDIARY LEGISLATION

List of Subsidiary Legislation

THE FERTILIZERS AND ANIMAL FOODSTUFFS (ANALYSIS) RULES

ARRANGEMENT OF RULES

THE FERTILIZERS AND ANIMAL FOODSTUFFS (ANALYSIS) RULES

[Legal Notice 215 of 1972, Legal Notice 292 of 1974]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Analysis) Rules.

2. (1) Samples for analysis shall be taken from Official Samples which have been taken and packed in the manner prescribed in the Fertilizers and Animal Foodstuffs (Sampling) Rules, 1972.

(2) The following apparatus shall be used in the preparation of a sample for analysis—

(a) sieves with apertures of 1 mm square and of between 2 and 3 mm square respectively;

(b) a laboratory mill fitted with a screen with 1 mm aperture;

(c) a porcelain pestle and mortar;

(d) an oven set to operate at 100°C; and

(e) stoppered or screw-capped storage bottles 250 ml and 500 ml.

3. (1) If the Official Sample is in a fine condition and passes through a sieve having apertures about 1 mm square it shall be thoroughly mixed and a portion not less than 250 gm in weight shall be placed in a storage bottle. From this portion the quantities for analysis shall be taken.

(2) If the Official Sample does not wholly pass through the sieve having apertures about 1 mm square, and wholly passes through the sieve having apertures between 2 and 3 mm square or if a change in a moisture content is likely to occur during the preparation of the Official Sample for analysis, the Official Sample shall be thoroughly mixed and a portion for the determination of moisture shall be taken at once.

(3) If the Official Sample is in a coarse condition (but can be pulverized) as, for example, pieces of broken cake, it shall be carefully pulverized until the whole passes through the sieve having apertures between 2 and 3 mm square. It shall then be thoroughly mixed and a portion for the determination of moisture shall be taken at once.

(4) Material which does not admit of being pulverized in its natural condition so that it will pass through the sieve having apertures between 2 and 3 mm square shall be mixed as thoroughly as its condition will allow. A portion of the coarse material shall then be taken for the determination of moisture and if the dry material can be pulverized, sufficient of the coarse material to produce at least 250 g of dried material shall similarly be dried and then pulverized, so that it will pass through the aforesaid sieve. It shall then be thoroughly mixed. A portion of the material which has been prepared in the manner prescribed in rules 3(1), 3(2), 3(3) and 3(4) of this rule weighing not less than 250 g shall then be taken and if necessary further pulverized until it passes through the sieve having apertures about 1 mm square. The portion of the sample so prepared shall be placed in a storage bottle and from it the quantities for analysis shall be taken.

(5) If the Official Sample is a liquid, it shall be placed in a storage bottle and shall be well stirred immediately before each sample is taken for analysis.

(6) For a grading analysis, the sample shall be taken direct from the Official Sample.

(7) Fertilizers or animal foodstuffs which separate readily into separate fractions which are not susceptible to mixing together during preparation for analysis shall be separated into their component fractions, each fraction shall be analysed as if it was a separate fertilizer or animal foodstuffs and the proportion of the separate fractions shall be allowed for in reporting the analysis.

(8) The moisture content of material which gains or loses moisture during its preparation for analysis shall be determined on a sample of the material which has been prepared for analysis each time a sample is taken for analysis.

(9) Any change in moisture content during preparation of the sample shall be allowed for in presenting the results of analysis.

(10) The samples taken for analysis and for moisture determination shall be drawn in as equal portion as possible from several well scattered points in the material which has been prepared for analysis or whose moisture content is being determined.

4. (1) The following apparatus shall be used for the determination of moisture in a fertilizer or in an animal foodstuff where the sample tested is deemed by the analyst to be suitable for drying at 100°C—

(a) a laboratory spoon or such other sampling tool as the analyst shall consider suitable for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance which is sensitive to 1 mg or less, and its weights;

(d) a laboratory oven set to operate at 100°C;

(e) a desiccator suitably charged with active desiccant.

(2) About 5 grams of the sample (or the minimum larger amount that, with regard to its coarseness, the analyst shall consider to be representative of the sample), weighed to the nearest milligram shall be heated in the oven for 2 to 3 hours. The sample shall then be placed in the desiccator to cool and shall then be re-weighed, again to the nearest milligram. The heating, cooling and weighing process shall be repeated until the difference in weight before and after heating is less than 5 mg. The percentage moisture shall be taken as the total loss in weight as a result of the heating process, in milligrams, multiplied by 100 and divided by the weight also in milligrams of the sample taken for the moisture determination.

(3) Where the sample is deemed by the analyst to be of a nature unsuitable for drying at 100°C, he may undertake the drying at a reduced pressure and at a much lower temperature as is compatible with the stability of the product and he may utilize phosphorus pentoxide or some other desiccating agent to assist the process, or he may employ any other method which is suited to the determination of the moisture content of the sample and he may use such specialized apparatus as the method may require. In these circumstances the moisture content reported shall be qualified by an indication of the method employed.

5. (1) The following apparatus and reagents shall be used for the determination of oil in an animal foodstuff—

(a) a laboratory spoon for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance which is sensitive to 1 mg or less and its weights;

(d) a laboratory oven set to operate at 100°C;

(e) an extraction apparatus of 60 ml capacity fitted with a water cooled reflux condenser;

(f) a fat-free extraction thimble to fit the aforesaid extraction apparatus;

(g) a receiving flask of 150 ml capacity whose weight is known to within 1 mg and which will fit the aforesaid extraction apparatus;

(h) a second receiving flask of 150 ml capacity whose weight is known to within 1 mg, which also will fit the aforesaid extraction apparatus;

(i) a radiant heat heater unit with energy regulated heat control to accommodate the aforesaid receiving flasks;

(j) a water cooled distillation condenser to fit the aforesaid receiving flask and a distillate receiver;

(k) a 9 to 11.5 cm outside diameter porcelain mortar and pestle;

(l) a dry 10 cm diameter glass filter funnel, 15 cm diameter general purpose filter papers;

(m) a desiccator suitably charged with active desiccant, glass rods;

(n) wash bottles;

(o) petroleum spirit boiling between 40° to 60°C.

(2) Between 3 and 5 gm weighed to the nearest milligram, of the analysis sample shall be placed in the extraction thimble and this shall then be placed in the extraction apparatus. The extraction apparatus shall then be fitted with a receiving flask into which has been placed about 100 ml of the petroleum spirit. The apparatus so assembled shall be heated for a total of 16 hours in the heater unit the heat control being kept so adjusted that condensate falls from the reflux condenser into the extraction apparatus throughout that time at the rate of 5 or 6 drops per second. The bulk of the petroleum spirit in the receiving flask shall then be distilled through the distillation condenser into the distillate receiver and the flask shall then be heated in the oven for 30 minutes, placed in the desiccator to cool and weighed to the nearest milligram. The heating, cooling and weighing process shall be repeated until the difference in weight of the receiving flask and its contents before and after heating is less than 3 mg. The percentage oil found shall be taken as the weight of the residue in the receiving flask in milligrams, multiplied by 100 and divided by the weight also in milligrams of sample taken for the analysis. Where an allowance for change in moisture content under rule 2(c) of these Rules must be made, the percentage oil reported shall be the percentage found divided by (100– the percentage moisture content of the sample determined as prescribed in rule 2(a) of these Rules) and multiplied by (100–the percentage moisture content of the Official Sample). Otherwise the percentage found shall be the percentage reported.

6. (1) The following apparatus and reagents shall be used for the determination of fibre in an animal foodstuff—

(a) a laboratory spoon for drawing the sample;
(b) a weighing bottle or boat;
(c) a laboratory balance which is sensitive to 1 mg or less, and its weights;
(d) a laboratory oven set to operate at 100°C;
(e) a laboratory furnace;
(f) a 400 ml beaker on which has been marked the level to which it would be filled by 200 ml of liquid measured at room temperature;
(g) a hot plate with an energy regulator heat control;
(h) a porcelain Buchner funnel about 10.5 cm diameter, 8 and 15 cm diameter glass filter funnels, muslin cloth whose weight shall be known to the nearest milligram;
(i) 4 cm diameter porcelain or silica dishes;
(j) a suction pump;
(k) a heat resistant suction flask;
(l) washing bottles, some with necks and mouthpieces insulated for handling hot liquids;
(m) beakers;
(n) a desiccator suitably charged with active desiccant;
(o) glass rods;
(p) a time piece and optionally, the extraction apparatus, energy regulated heating unit and a receiving flask as prescribed under rule 5 of these Rules;
(q) petroleum spirit boiling between 60° to 80°C;
(r) 0.255N sulphuric acid;
(s) 0.313N sodium hydroxide which is free or nearly free of sodium carbonate;
(t) a 1 per cent hydrochloric acid solution prepared by diluting 10 ml of concentrated hydrochloric acid with water to 1 litre;
(u) 95 per cent alcohol; and
(v) Diethylether.

(2) A small weighed portion of the sample which has been prepared for analysis in the manner prescribed in rule 2 of these Rules, shall be heated with an excess of the 1 per cent hydrochloric acid.

(3) If no effervescence is observed, between 2.7 and 3.0 gm, of the sample which has been prepared for analysis in the manner prescribed in rule 2 of these Rules shall be taken and weighed to the nearest milligram.

(4) The weighed sample shall be extracted with the petroleum spirit in the manner prescribed in rule 6 of these Rules or by stirring, settling and decanting three times with the petroleum spirit in a small beaker. The sample shall in no manner be ground in the extraction process. The extracted sample shall be air-dried and transferred to a 400 ml beaker. Sufficient of the 0.255N sulphuric acid to fill the flask to its 200 ml mark shall then be heated to its boiling point. 30 to 40 ml of this solution shall then immediately be added to the extracted sample.

(5) The beaker shall be gently swirled to disperse the sample. Sufficient of the heated sulphuric acid solution shall then immediately be added to fill the beaker to the 200 ml mark. The beaker and its contents shall be heated on the hot plate so that they come to the boil within 1 minute. The boiling shall then be continued gently for exactly 30 minutes. During boiling the beaker shall be swirled every few minutes in order to mix the contents and remove particles from the sides. Meanwhile the Buchner funnel shall be prepared by placing a muslin cloth over the holes of the plate. The Buchner funnel shall then be fitted in the suction flask and boiling water shall be poured into the funnel and this shall be allowed to remain in the funnel until the funnel is hot. The hot water shall then be drawn away by the application of suction. At the end of the 30 minutes of boiling the beaker shall be removed from the hot plate and the acid mixture poured at once into a shallow layer of hot water which is under gentle suction in the prepared funnel. The suction shall then be so adjusted that the filtration of the bulk of the 200 ml of acid mixture is completed within 10 minutes. If the filtration takes longer than 10 minutes, the determination shall be discarded and a new determination shall be undertaken. The residues from the sulphuric acid extraction shall then be washed with boiling water until the washings are free from acid. Sufficient of the 0.313N solution of sodium hydroxide to fill the beaker to the 200 ml mark shall be brought to boiling point in an insulated wash bottle and some of it shall be used to wash the residue on the muslin cloth and in the funnel back into a 400 ml beaker. Sufficient of the hot sodium hydroxide solution shall then immediately be added to fill the beaker to its 200 ml mark. The beaker shall then be put on the hot plate and again heated so that its contents come to the boil within 1 minute. Boiling shall then be continued gently and continuously for exactly 30 minutes. During boiling the beaker again shall be swirled every few minutes in order to mix its contents and remove particles from the sides. At the end of this 30-minute boiling period, the beaker shall be removed from the hot plate and its contents shall be transferred to a muslin cloth in a 15 cm filter funnel. Any insoluble material remaining in the beaker shall be transferred to the muslin cloth by washing with boiling water and the residue shall then be well washed on the muslin cloth with boiling water. The residue shall then be washed with the 1 per cent hydrochloric acid solution. The residue shall then be rewashed with boiling water until it is free from acid. The residue shall then be washed twice with the 95 per cent alcohol and three times with the diethylether. The residue on the muslin cloth shall be transferred with diethylether to a weighed dried silica dish whose weight shall have been determined to the nearest milligram. The silica dish and its contents shall then be heated in the oven for 30 minutes, placed in the desiccator to cool and weighed to the nearest milligram. The heating, cooling and weighing process shall be repeated until the difference in weight before and after heating is less than 3 mgm. The silica dish and its contents shall then be placed in the silica capsule and the capsule and its contents shall be placed in the furnace, the furnace then being cool. The furnace and its contents shall then be heated until the contents of the silica capsule are incinerated, but the temperature inside the furnace during that

time shall not be allowed to exceed 600°C. The capsule and its incinerated content shall be placed in the desiccator to cool and shall then be reweighed to the nearest milligram. The amount whereby the weight of the silica dish and its contents after the incineration exceeds the known weight of the said silica dish, empty, shall be taken as the weight of ash in the residue. The apparent fibre content of the sample shall be taken as the amount whereby the weight of dry residue collected on the muslin cloth exceeds the weight of ash in the residue. The actual fibre content multiplied by the factor (0.0102t—0.02), where 't' is the observed boiling point of water in °C in the laboratory at which the determination was carried out. The percentage fibre found shall be taken as the actual fibre content so found in milligrams, multiplied by 100 and divided by the weight also in milligrams, of sample taken for analysis. Where an allowance for change in moisture content under rule 2 of these Rules must be made, the percentage fibre reported shall be the percentage found, divided (100 —the percentage moisture content of the sample determined as prescribed in rule 2(b) of these Rules) and multiplied by (100—the percentage moisture content of the Official Sample). Otherwise the percentage found shall be the percentage reported.

(6) If an effervesence is observed in application of the test prescribed in section (a) of this rule, the suspension shall be stirred well and allowed to settle. The supernatant liquid shall be decanted through a 12.5 cm general purpose filter paper of known weight in an 8 cm filter funnel and the residue shall be washed twice and then transferred to the filter paper. The residue and the filter paper shall then be dried in the oven and reweighed.

(7) The quantity of the sample taken for the test in accordance with these Rules which would be sufficient to give 2.7 gm and 3.0 gm respectively of residue after treatment in the manner prescribed in rule 6(b) of this rule shall then be calculated.

(8) A quantity of the sample which has been prepared for analysis in the manner prescribed in rule 2 of these Rules which shall be between the weights calculated in rule 6(7) of this rule shall then be taken and weighed to the nearest milligram. The weighed sample shall then be extracted with the petroleum spirit in the manner prescribed in rule 6(4) of this rule and transferred to the 400 ml beaker. The extract sample shall then be treated in the beaker with an excess of the 1 per cent hydrochloric acid and the suspension shall be agitated well and allowed to settle. The supernatant liquid shall be decanted through a muslin cloth in an 8 cm filter funnel. The residue shall then be washed twice with water by decantation through muslin cloth. The residue in the beaker and on the muslin cloth shall then be allowed to drain thoroughly. Sufficient of the 0.255N sulphuric acid to fill the 400 ml beaker to its 200 ml mark shall then be heated to its boiling point and 30 to 40 ml of the hot acid shall be used to wash any particles on the muslin cloth back into the beaker. The fibre determination shall then proceed in the manner prescribed in rule 6(5) of this rule.

7. (1) The following apparatus and reagents shall be used for the determination of nitrogen in a fertilizer or in an animal foodstuff—

(a) a laboratory spoon for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance which is sensitive to 1 mg or less, and its weights;

(d) pipettes 25, 50 and 100 ml minimum specification B.S. 1583, Class B;

(e) burettes 50 ml minimum specification B.S. 846, Class B;

(f) measuring cylinders 25 ml;

(g) flat bottom flasks 50 and 100 ml;

(h) glass rods;

(i) a time piece;

(j) 50 per cent sodium hydroxide solution, prepared by dissolving 500 gm of sodium hydroxide in water and diluting to 1 litre;

(k) 0.1N, 0.2N or 0.5N standard hydrochloric acid or sulphuric acid, the concentration used shall be as prescribed under this rule as the case may be. The standard acid shall be adjusted to exact normality against a corresponding standard sodium carbonate solution;

(l) 0.1N, 0.2N or 0.5N standard sodium hydroxide, the concentration used shall be as prescribed under this rule as the case may be. The standard sodium hydroxide shall be adjusted to exact normality against the corresponding standard acid;

(m) methyl red solution, prepared by adding 0.5 ml of 0.1N sodium hydroxide to 5 ml of 90 per cent industrial methylated spirits, dissolving in this solution 25 mgm of methyl red and diluting the resultant solution to 250 ml with 50 per cent industrial methylated spirits.

(2) The following apparatus and reagents in addition to those specified in paragraph (1) of this rule shall be used for determination of nitrogen in a fertilizer in which nitrogen is declared to be present only in organic and ammonium forms or protein in an animal foodstuff—

(a) Kjeldahl flasks 500 to 600 ml;

(b) ammonia distillation apparatus to fit the aforesaid Kjeldahl flasks, each comprising a Liebig condenser mounted vertically and connectable to its flask through a splash-head and vertical delivery still head connecting tube;

(c) radiant heat heater units with energy regulator heat controls to accommodate the aforesaid Kjeldahl flasks;

(d) concentrated sulphuric acid;

(e) paraffin wax;

(f) potassium sulphate or anhydrous sodium sulphate;

(g) crystalline copper sulphate or elemental selenium;

(h) litmus indicator papers; and

(i) pure sucrose.

(3) About 2 gm, weighed to the nearest milligram, of the sample which has been prepared for analysis in the manner prescribed in rule 2(a) of these Rules shall be placed in a Kjeldahl flask and to it shall be added 25 ml, measured by measuring a cylinder, of the concentrated sulphuric acid. The flask then shall be gently heated until frothing ceases. If frothing is excessive 0.5 gm of the paraffin wax shall also be added.

(4) 10 gm of potassium sulphate or anhydrous sodium sulphate and 0.5 gm of the copper sulphate or elemental selenium shall then be added and the flask strongly heated until the colour of the clear liquid ultimately obtained ceases to diminish. Heating shall then continue for a further one and a half hours. The contents of the Kjeldahl flask shall then be allowed to cool and water shall be added, at first in small quantities with further intervals of cooling of the flask as necessary, until a total volume of about 250 ml is obtained. A piece of litmus paper shall then be placed in the diluted solution and, with swirling of the flask to ensure mixing, the 50 per cent solution of sodium hydroxide shall be added slowly until the litmus paper just turns blue. A further 10 ml, measured by measuring cylinder of the sodium hydroxide solution shall then be poured carefully down the side of the flask so that it does not mix at once with the other constituents of the flask. The flask shall then at once be mounted in a heater unit and connected to the ammonia distillation apparatus, the outlet shall dip into a measured volume of standard sulphuric or hydrochloric acid, in a 500 ml flat bottom flask. The amount and normality of standard acid into which the ammonia distillation apparatus outlet shall dip shall be determined by the amount of nitrogen which the fertilizer or the amount of crude protein which the animal foodstuff is believed to contain and shall be in accordance with the following table—

TABLE 1

VOLUME AND NORMALITY OF STANDARD ACID IN THE DETERMINATION OF NITROGEN

Where the N content is believed to be:	*or where the crude protein is believed to be:*		*the No. of ml. of standard acid taken shall be:*	*and its normality shall be:*
	(a) in pure wheat products:	(b) in all other Animal Foodstuffs:		
less than 3 %	less than 16%	less than 17.5%	50	0.1__N__
at least 3 % but less than 4 %	at least 16% but less	at least 17.5 % but less than 25.0%	75	0.1__N__
at least 4 % but less than 6%	than 23%	at least 25.5% but less than 37.5%	100	0.1__N__
at least 6 % but less than 8%	at least 23%	at least 37.5% but less than 50.0%	125	0.1__N__
at least 8 % but less than 12%		at least 50.0%	100	0.1__N__
at least 12 % but less than 16%			125	0.2_N_
at least 16 % but less than 20%			150	0.2_N_
at least 20 % but less than 30%			100	0.2_N_
at least 30 % but less than 40%			125	0.5_N_
at least 40%			150	0.5_N_

(5) A blank determination shall be undertaken alongside the actual determination using the same amounts of the same reagents for the digestion and distillation, and for taking up the distillate and the same standard alkali for titrating the excess acid as were used in the actual determination, but with 2 gm of pure sucrose in place of the sample. In the blank determination the bulk of the standard alkali used to neutralize the excess of standard acid may be measured by a 50 or 100 ml pipette as the case may be. The titrations shall be made to the nearest 0.05 ml. If the number of millilitres and parts of a millilitre of standard sodium hydroxide required to neutralize the standard acid in the blank determination is expressed as x and the number of millilitres and parts of a millilitre similarly required in the actual determination is expressed by y, the percentage nitrogen found shall be taken as (x- y) multiplied by 1.4 times the normality of the standard acid used to take up the distillate and divided by the weight in grams and parts of a gram of sample taken for the analysis.

(6) Where the animal foodstuff is a pure wheat product, the percentage crude protein found shall be taken as percentage nitrogen found multiplied by 5.70. In all other animal foodstuffs, the percentage crude protein found shall be taken as the percentage nitrogen found multiplied by 6.25.

(7) Where an allowance for change in moisture content under rule 2(c) of these Rules must be made the percentage nitrogen or crude protein reported shall be the percentage found, divided by (100—the percentage moisture content of the sample determined as prescribed by rule 2(b) of these Rules) and multiplied by (100—the percentage moisture content of the Official Sample). Otherwise the percentage found should be the percentage reported.

(8) The following apparatus and reagents in addition to those specified in this rule shall be used for the determination of nitrogen in Sulphate of ammonia, Diammonium phosphate or in a compound fertilizer in which the nitrogen is declared to be present only as ammonium nitrogen—

(a) a Markham ammonia distillation apparatus which embodies a sample chamber, a funnel, a splash-head welded onto a Liebig Condenser and a steam inlet;

(b) volumetric flasks 250 ml minimum specification B.S. 846, Class B;

(c) flat bottom flasks 1,000 ml;

(d) 8-15 cm diameter glass filter funnel; and

(e) 15-24 cm diameter general purpose filter papers.

(9) About 2 gm, weighed to the nearest milligram, of the sample which has been prepared for analysis in the manner prescribed in rule 2(a) of these Rules, shall be transferred to a 250 ml volumetric flask. Here it shall be dissolved in about 200 ml of water with vigorous shaking to ensure complete solution if necessary. The contents of the flask shall then be diluted to volume and the solution shall be filtered if cloudy or if it contains visible insoluble matter through a dry filter paper in the filter funnel into a dry 500 ml flat bottom flask.

(10) 10 ml measured by pipette of the clear solution shall be transferred into the sample chamber of the Markham still through the funnel, and 10 ml measured by measuring cylinder of 50 per cent sodium hydroxide solution shall be introduced slowly into the sample chamber and the provided plug shall be replaced into the funnel. Steam shall be slowly introduced into the mixture by closing the washings outlet. The distillate outlet shall dip into a measured volume of 2 per cent boric acid solution containing a mixed indicator of methyl red and bromocresol green. The distillate is collected in 3 minutes. The amount of ammonia in the distillate shall then be titrated from a burette with standard hydrochloric or sulphuric acid. A blank determination shall be undertaken alongside the actual determination, using the same amount of the same 50 per cent sodium hydroxide solution as was used in distillation, the same amount of 2 per cent boric acid solution as was used to take up the distillate and the same standard acid as was used to titrate the ammonia in the actual determination. The titrations shall be made to the nearest 0.05 ml. Express results in terms of nitrogen 1 ml 0.02N acid = 0.00014 gm nitrogen. Where an allowance for change in moisture content under these Rules must be made, the percentage nitrogen reported shall be the percentage found divided by (100—the percentage moisture content of the sample determined as prescribed under these Rules) and multiplied by (100—the percentage moisture content of the Official Sample). Otherwise the percentage found shall be the percentage reported.

(11) The following reagents in addition to the apparatus and reagents specified under the rule shall be used for the determination of nitrogen in Ammonium Sulphate Nitrate, Calcium Ammonium Nitrate, Nitrate of Soda or in a compound fertilizer in which nitrogen is declared to be present entirely as nitrate nitrogen or as ammonium nitrogen and nitrate nitrogen: Devarda's alloy, finely powdered so that not less than 80 per cent will pass through a sieve having apertures about 0.25 mm square. A solution of the fertilizer shall be prepared in the manner prescribed under this rule. 10 ml of the clear solution shall then be transferred to a Markham distillation apparatus and to it shall be added 1 gm of the Devarda's alloy and 5 ml of water. 10 ml measured by measuring cylinder of the 50 per cent sodium hydroxide solution shall be poured carefully down the side of the sample chamber so that it does not

mix at once with the other constituents of the flask. The distillate outlet shall dip into a measured volume of 2 per cent boric acid solution in a 100 ml flat bottom flask. The contents of the distillation apparatus shall then be mixed and allowed to stand in the cool for 10-15 minutes. Steam shall then be introduced slowly increasing gently to a steady bubbling. The distillate is collected in the boric acid in six minutes. The nitrogen determination shall then proceed in the manner prescribed under this rule.

(12) The apparatus specified under this rule and the reagents specified under this rule shall be used for the determination of nitrogen in urea or in a urea containing compound fertilizer in which no nitrate nitrogen is declared to be present.

(13) About 2 gm, weighed to the nearest milligram, of the sample which has been prepared for analysis in the manner prescribed under these Rules shall be placed in a Kjeldahl flask and to it shall be added, first 50 ml of water and then slowly with frequent shaking and cooling, 25 ml measured by measuring cylinder, of concentrated sulphuric acid. The Kjeldahl flask which shall then be gently heated until the water is expelled. The Kjeldahl flask with contents shall then be cooled to room temperature. The digest shall then be transferred to a volumetric flask of 500 ml capacity using small quantities of distilled water and the volume shall be adjusted to 500 ml. The nitrogen determination shall then proceed in the manner prescribed in subsection (c)(iii) of this rule.

(14) The following reagent in addition to the reagents specified in this rule and the apparatus specified in this rule shall be used for the determination of nitrogen in an organic nitrogen or urea containing compound fertilizer in which nitrate nitrogen is also declared to be present—

Crystalline Sodium Thiosulphate.

(15) About 2 gm weighed to the nearest milligram, of the sample which has been prepared for analysis in the manner prescribed in these Rules shall be taken and treated with sulphuric acid in the manner prescribed in these Rules accordingly as the fertilizer is or is not believed to contain urea. It shall then be cooled, 5 gm of the crystallized sodium thiosulphate shall be added in small amounts and the whole shall be allowed to stand for one hour with occasional shaking. The nitrogen determination shall then proceed in the manner prescribed in subsection (b)(ii) and part of subsection (b)(iii) of this rule.

8. (1) The following apparatus and reagents shall be used for the determination of phosphate in a fertilizer or in an animal foodstuff—

(a) a laboratory spoon for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance which is sensitive to 1 mg or less, and its weights;

(d) volumetric flasks 100 ml and 250 ml minimum specification B.S. 1792, Class B;

(e) volumetric flasks 50 and 200 ml minimum specification B.S. 1792, Class B, if prescribed in this rule;

(f) pipettes 10, 25 and 50 ml minimum specification B.S. 1583, Class B;

(g) burettes 50 ml minimum specification B.S. 846, Class B. Graduated pipettes 25 ml, minimum specification B.S. 700, Class B, Type 2;

(h) measuring cylinders 5, 10, 25 and 500 ml, minimum specification B.S. 604, Class B;

(i) wash bottles;

(j) a spectrophotometer, with a monochromator capable of being set to give a source of light with wavelength of 4200A°, or a colorimeter or absorptiometer fitted with a 425A°, violet light filter, with two cells of 1 cm optical length;

(k) a time piece;

(l) a dry flat bottom flask 1,000 ml;

(m) a dry 20 cm diameter glass funnel;

(n) 32 cm diameter medium fine filter papers;
(o) glass rods;
(p) graph paper, 1 mm rulings;
(q) sodium sulphate solution, prepared by dissolving 54 gm anhydrous sodium sulphate in 500 ml water;
(r) vanadium molybdate reagent, prepared by dissolving separately 20 gm of ammonium molybdate and 1 gm of ammonium vanadate in water, mixing, acidifying with 140 ml of concentrated nitric acid, and diluting with water to 1 litre;
(s) phosphate stock solution, prepared by dissolving in water, 1.9173 gm of potassium dihydrogen phosphate which had previously been dried at 150°C for one hour and cooled in a desiccator and diluting to 1,000 ml in a volumetric flask; and
(t) standard phosphate solution, prepared by diluting 50 ml measured by pipette, of phosphate stock solution to 250 ml, in a volumetric flask. This solution contains 0.2 mgm of phosphorus pentoxide per millilitre.

(2) The following apparatus and reagents in addition to those specified above shall be used for the determination of water soluble phosphate in a fertilizer—
(a) volumetric flasks 50 and 500 ml, minimum specification B.S. 1792, Class B;
(b) a laboratory shaking machine accommodating the aforesaid 500 ml volumetric flask;
(c) a safety pipette 1 ml;
(d) beakers 50 ml;
(e) a hot plate with an energy regulator heat control;
(f) litmus paper;
(g) concentrated nitric acid;
(h) approximately 1.0N sodium hydroxide.

(3) Between 9.9 and 10.1 gm, weighed to the nearest milligram, of the sample which has been prepared for analysis in the manner prescribed in rule 2(a) of these Rules, shall be transferred to a 500 ml volumetric flask. 400 ml of water at 20°C shall then be added and the flask shall be shaken continuously for 30 minutes on the shaking machine. The contents shall then be diluted to volume, mixed well and filtered through a dry 32 cm filter paper in the dry filter funnel into the dry flat bottom flask.

(4) 25 ml measured by pipette, of the filtrate shall be transferred to the 50 ml beaker and to it shall be added by safety pipette, 1 ml of the concentrated nitric acid. The solution shall then be heated to incipient boiling on the hot plate and maintained at this temperature for 10 minutes. It shall then be cooled, a piece of litmus paper shall be placed in the solution and approximately 1.0N sodium hydroxide solution shall be added slowly, with stirring, until the paper starts to turn blue. The solution shall then be transferred to a 50 ml volumetric flask and diluted to volume.

(5) This solution shall then be further diluted with water at 20°C to an extent which shall be determined by the percentage of phosphorus pentoxide which is believed to be present in accordance with the following table—

TABLE 2

PHOSPHATE DILUTION IN RELATION TO PHOSPHATE LEVELS IN FERTILIZERS

Where the P205 content being measured is believed to be:	*the Nos. of ml. of solution which shall be taken for dilution shall be*	//and it shall be diluted in a volumetric flask to://
less than 5%	24	50 ml

At least 5% but less than 5.5%	22	50 ml
At least 5.5% but less than 6%	20	50 ml
At least 6% but less than 6.5%	19	50 ml
At least 6.5% but less than 7%	17	50 ml
At least 7% but less than 7.5%	16	50 ml
At least 7-5% but less than 8%	15	50 ml
At least 8% but less than 8.5%	14	50 ml
At least 8.5% but less than 9.5%	13	50 ml
At least 9.5% but less than 10 /0	12	50 ml
At least 10% but less than 1%	22	100 ml
At least 11 % but less than 12%	20	100 ml
At least 12% but less than 13%	19	100 ml
At least 13% but less than 14%	17	100 ml
At least 14% but less than 15%	16	100 ml
At least 15% but less than 16%	15	100 ml
At least 16% but less than 17%	14	100 ml
At least 17% but less than 19%	13	100 ml
At least 19% but less than 20%	12	100 ml
At least 20% but less than 22 % ..	22	200 ml
At least 22% but less than 24.5% ..	20	200 ml
At least 24-5% but less than 27-5% ..	18	200 ml
At least 27.5% but less than 30.5% ..	16	200 ml
At least 30-5% but less than 33% ..	15	200 ml
At least 33 % but less than 35 % ..	14	200 ml
At least 35% but less than 38% ..	13	220 ml

At least 38% but less than 41% ..	12	200 ml
At least 41 % but less than 45% ..	11	200 ml
At least 45% but less than 49-5% ..	10	200 ml
At least 49-5%	9	200 ml

The solution taken for dilution shall be measured by graduated pipette.

(6) 25 ml measured by pipette, of the solution obtained as a result of the dilution prescribed in subsection (b)(iv) of this rule shall then be placed in a 100 ml volumetric flask.

(7) Into a series of seven 100 ml volumetric flasks shall be measured by a burette, 25.0, 26.0, 27.0, 28.0, 29.0, 30.0 and 31.0 ml of the Standard Phosphate solution (containing respectively 5.0, 5.2, 5.4, 5.6, 5.8, 6.0 and 6.2 mgm P2O5).

(8) To each of these samples of the Standard Phosphate solution and to the 25 ml aliquot of diluted sample solution shall be added by pipette, 10 ml of the sodium sulphate solution and 25ml of the vanadium molybdate reagent at a temperature of 20°C. The solution in each flask shall then be diluted to volume with water at 20°C, shall be mixed and shall be allowed to stand for ten minutes while its colour develops.

(9) While these solutions are so standing, the spectrophotometer shall be set to operate at 4200A° (or the colorimeter or absorptiometer shall be brought into operation as the case may be). Then the ten minutes standing period having been completed and following the procedures which are appropriate to the operation of the instrument used, the optical densities of its cells shall be compared, using the coloured standard solution containing 5.0 mgm P2O5 per 100 ml if the comparison reveals that there is a small difference between the two cells being used, the cell with the lower optical density shall be used as the standard reference cell. The apparent optical densities of the coloured standard solutions and of the coloured sample solution relative to the coloured standard solution containing 5.0 mgm P2O5, per 100 ml shall then be determined. The apparent optical densities of the coloured standard solutions shall be plotted on a calibration graph against their phosphorus pentoxide content values. The number of milligrams and parts of a milligram of phosphorus pentoxide per 100 ml of coloured standard solution having the same optical density as the coloured sample solution shall then be determined by interpolation on the calibration graph. The determination shall be made to the nearest 0.01 mgm. A new Standard Phosphate solution, a new set of coloured standards prepared as prescribed in this rule and a new calibration graph shall be prepared for each phosphate determination.

(10) If the number of milligrams and parts of a milligram of phosphorus pentoxide so found in the 100 ml of coloured sample solution is expressed as x, if the number of millilitres of solution taken in making the dilution prescribed in this rule, is expressed as y, and if the sample is believed to contain less than 10 per cent water soluble phosphorus pentoxide, then the percentage water soluble phosphorus pentoxide found in the sample shall be taken x/y multiplied by 200 and divided by the weight in grams and parts of a gram of sample taken for the analysis. If the sample is believed to contain at least 10 per cent but less than 20 per cent water soluble phosphorus pentoxide, then the percentage found in the sample shall be taken as x/y multiplied by 400 and divided by the x/y weight in grams and parts of a gram of sample taken for the analysis. If the sample is believed to contain at least 20 per cent water soluble phosphorus pentoxide, then the percentage found shall be taken as x/y multiplied by 800 and divided by the weight in grams and parts of a gram of sample taken for the analysis. Where an allowance for change in moisture content under these Rules must be made, the percentage water soluble phosphorus pentoxide reported shall be the percentage found, divided by (100—the percentage moisture content of

the sample determined as prescribed under these Rules) and multiplied by (100— the percentage moisture content of the Official Sample). Otherwise, the percentage found shall be the percentage reported.

(11) The following apparatus and reagents in addition to those specified in this rule shall be used for the determination of citric soluble phosphorus pentoxide in a fertilizer—

(a) a stoppered shaking bottle, 1 litre;

(b) a laboratory shaking machine to accommodate the aforesaid shaking bottle;

(c) a volumetric flask 1,000 ml minimum specification B.S. 1792, Class B;

(d) a measuring cylinder 500 ml;

(e) graduated pipettes 5 and 10 ml minimum specification B.S. 700, Class B, Type 2;

(f) as required for the 2 per cent citric acid solution additions prescribed in this rule;

(g) two per cent acid, prepared by dissolving 20 gm of pure crystallized citric acid, monohydrate in water and diluting to volume at 20°C in a 100 ml volumetric flask.

(12) Between 4.9 and 5.1 gm weighed to the nearest milligram of the sample which has been prepared for analysis in the manner prescribed in these Rules shall be placed in the stoppered shaking bottle. To it shall be added 500 ml measured by measuring cylinder, of the 2 per cent citric acid solution, with shaking so as to avoid the possibility of the fertilizer caking. The flask shall then be shaken continuously for 30 minutes on the shaking machine. After shaking, the whole of the liquid shall be poured at once into a dry filter paper in the dry filter funnel and the filtrate collected in the dry flat bottom flask. If the filtrate is not clear it shall be passed again through the same filter. The solution shall be diluted in the manner prescribed in this rule.

(13) 25ml measured by pipette of the diluted solution shall then be placed in a 100 ml volumetric flask.

(14) Into a series of seven 100 ml volumetric flasks shall be measured by burette 25.0, 26.0, 27.0, 28.0, 29.0, 30.0 and 31.0 ml of the standard phosphate solution containing respectively 5.0, 5.2, 5.4, 5.6, 5.8, 6.0 and 6.2 mgm P2O5. If the fertilizer is believed to contain less than 10 per cent of phosphorus pentoxide which is soluble in 2 per cent citric acid, 0.5ml of the 2 per cent acid solution shall be added to each of these standard phosphorus solutions for every 1 ml of sample solution used in the dilution to 50 ml prescribed in this rule. If the fertilizer is believed to contain at least 10 per cent but less than 20 per cent of phosphorus pentoxide which is soluble in 2 per cent citric acid, 0.25 ml of the 2 per cent citric solution shall be added to each of these standard phosphorus solutions for every 1 ml of sample solution used in the dilution to 100 ml prescribed in this rule. If the fertilizer is believed to contain at least 20 per cent of phosphorus pentoxide which is soluble in 2 per cent citric acid, 0.125 ml of the 2 per cent citric acid solution shall be added to each of these standard phosphorus solutions for every 1 ml of sample solution used in the dilution to 200 ml prescribed in this rule. These citric acid solution additions shall be measured by graduated pipette and shall be to the nearest 0.1 ml. The phosphate determination shall then proceed in the manner prescribed in this rule.

(15) If the number of milligrams and parts of a milligram of phosphorus pentoxide so found in the 100 ml of coloured sample solution is expressed as x; if the number of millilitres of solution taken in the dilution in the manner prescribed in this rule is expressed as y, and if the sample is believed to contain less than 10 per cent of phosphorus pentoxide which is soluble in 2 per cent citric acid, then the percentage citric soluble phosphorus pentoxide found in the fertilizer shall be taken as x/y multiplied by 100 and divided by the weight in grams and parts of a gram of sample taken for the analysis. If the sample is believed to contain at least 10 per cent but less than 20 per cent of phosphorus pentoxide which is soluble in 2 per cent citric acid, then the percentage found shall be taken as x/y multiplied by 200 and divided

by the weight in grams and part of a gram of sample taken for analysis. If the sample is believed to contain at least 20 per cent of phosphorus pentoxide which is soluble in 2 per cent citric acid, then the percentage found shall be taken as x/y multiplied by 400 and divided by the weight in grams and parts of a gram of sample taken for the analysis. Where an allowance for a moisture content under these Rules must be made, the percentage citric soluble phosphorus pentoxide reported shall be the percentage found, divided by 100 minus the percentage moisture content reported of the sample determined as prescribed under these Rules and multiplied by 100 minus the percentage moisture content of the Official Sample. Otherwise, the percentage found shall be the percentage reported.

9. (1) The following apparatus and reagents in addition to those specified under rule 8(1) of these Rules shall be used for the determination of total phosphorus pentoxide in a mineral fertilizer—

(a) a beaker 400 ml;

(b) a hot plate with energy regulator heat control;

(c) a volumetric flask 500 ml minimum specification B.S. 1792, Class B;

(d) safety pipettes 10 ml;

(e) concentrated nitric acid;

(f) concentrated hydrochloric acid.

(2) Between 4.9 and 5.1 gm weighed to the nearest milligram of the sample which has been prepared for analysis in the manner prescribed in rule 2(a) of these Rules shall be placed in the 400 ml beaker. 100 ml of water shall be added and the whole shall be stirred thoroughly. The mixture shall then be brought to the boil and to the boiling liquid shall be added by safety pipette, 10 ml of the concentrated hydrochloric acid in a fine stream and then 10 ml of the concentrated nitric acid. The mixture shall continue to be boiled for 10 minutes and shall then be cooled, transferred to the 500 ml volumetric flask and diluted to volume at 20°C with distilled water. The contents of the flask shall be mixed well and filtered through a dry filter paper in the dry filter funnel into the dry flat bottom flask, the first 10 to 20 ml of filtrate being discarded.

(3) The phosphate determination shall then proceed in the manner prescribed in subsections (b)(iv), (v), (vi), (vii), (viii) and (c)(v) of this rule.

10.(1) The following apparatus and reagents in addition to those specified under rule 8(1) of these Rules shall be used for the determination of total phosphate in a fertilizer containing organic material or in an animal foodstuff—

(a) a silica capsule or dish about 55 mm diameter;

(b) a hot plate with an energy regulator heat control;

(c) a laboratory oven set to operate at 100°C;

(d) a laboratory furnace;

(e) beakers 400 ml;

(f) a volumetric flask 500 ml, minimum specification B.S. 1792, Class B;

(g) a graduated safety pipette 23 ml type 2;

(h) a safety pipette 5 ml;

(i) an 8 cm diameter glass funnel;

(j) 12.5 cm diameter medium fine filter papers;

(k) a watch glass 9 cm diameter;

(l) calcium oxide;

(m) concentrated nitric acid; and

(n) concentrated hydrochloric acid.

(2) Between 4.9 and 5.1 gm weighed to the nearest milligram of the sample which has been prepared in the manner prescribed under these Rules shall be placed in the silica capsule or dish. 1 gm of calcium oxide shall then be added and mixed with the sample and the mixture shall be thoroughly wetted with water. The wet mixture shall then be dried in the oven. It shall then be heated gently and finally incinerated

in the furnace to destroy as much organic matter as possible, but the temperature in the furnace during that time shall not be allowed to exceed 500°C.

(3) The incinerated material shall then be allowed to cool and shall be transferred to the 400 ml beaker with 10 ml of distilled water. 12 ml of the concentrated hydrochloric acid shall then be added, the addition being made sufficiently slowly to avoid loss by effervescence. 5 ml of the concentrated nitric acid shall then be added. The mixture shall then be heated to incipient boiling and kept at that temperature for 10 minutes. About 10 ml of water shall then be added and the solution filtered through a 12.5 cm filter paper in an 8 cm filter funnel into a 400 ml beaker, any insoluble material remaining being transferred to the filter with minimum amount of water and washed twice with small quantities of water. The filtrate on the beaker shall then be protected with the watch glass.

(4) The filter paper and the insoluble matter it contains shall then be transferred to the original capsule or dish and dried in the oven. It shall then be heated gently and finally incinerated in furnace, the incineration being continued until all the carbon is destroyed, but the temperature in the furnace during that time shall not be allowed to exceed 500°C.

(5) The resultant ash shall then be combined with the filtrate which had been protected with the watch glass in a beaker and the whole shall be heated to boiling. The solution shall then be cooled to 20°C, transferred to a 500 ml volumetric flask diluted to volume, mixed well and filtered through a dry 32 cm filter paper in the dry 20 cm filter funnel into the dry flat bottom flask, the first 10 to 20 ml of filtrate being discarded.

(6) The phosphate determination shall then proceed in the manner prescribed under this rule.

11.(1) The following apparatus shall be used for the determination of the percentage material passing through a Standard Test sieve—

(a) a laboratory spoon for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance sensitive to 1 cg or less, and its weights;

(d) a laboratory oven set to operate at 100°C;

(e) a standard sieve, minimum specification B.S. 140, of the mesh prescribed for the determination, with a fitted lid and lower receiver;

(f) a time piece;

(g) a small weighed beaker;

(h) a smooth clean dry hardwood surface;

(i) a sharp edged ruler;

(j) a camel hair dabbing brush; and

(k) a camel hair flat brush.

(2) A large portion of the Official Sample shall be mixed thoroughly on the hardwood surface and a representative portion thereof obtained by applying the procedure prescribed under rule 15 of the Fertilizer and Animal Foodstuffs (Sampling) Rules, 1972 (L.N. 214/1972), for obtaining a sub-sample and weighting at least 25 gm, shall be dried at 100°C and cooled. About 20 gm, weighed to the nearest centigram, of the dried sample shall be transferred to the sieve with the lower receiver attached. The lid shall then be fitted and the sieve shall then be shaken for five minutes with frequent tapping of the sides. The powder which collects in the lower receiver during the shaking shall then be brushed with the flat brush into the small weighed beaker and weighed to the nearest centigram. The sieving unit shall then be reassembled and shaking and tapping shall be continued for two minutes. The powder which has collected in the lower receiver during this second shaking period shall then be added to the first portion and the weighing repeated. The shaking, tapping and weighing processes shall be continued until no more than four centigrams of powder passes through the sieve in a two-minute shaking period.

(3) The fibres of the dabbing brush shall be applied to any lumps remaining on the sieve after each shaking period so as to cause them to disintegrate but care shall be taken that the hard parts of the brush do not make contact with the lumps during the disintegration or that the brush is not used to brush particles through the sieve.

(4) The percentage material reported as passing through the sieve shall be taken as the total weight of powder in centigrams collected in the lower receiver, divided by the weight in grams and parts of a gram of dried sample taken for the determination.

12.(1) The following apparatus and reagents shall be used for the determination of free acid in Sulphate of ammonia—

(a) a laboratory spoon for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance sensitive to 1 centigram or less, and its weights;

(d) burettes of capacity appropriate to the percentage of acid believed to be present in the sample, minimum specification B.S. 846, Class B;

(e) a flat bottom flask 400 ml;

(f) a 10 cm diameter glass funnel;

(g) 15 cm diameter general purpose filter papers;

(h) glass rods;

(i) 0.1N standard sodium hydroxide, standardized against 0.1N sulphuric or hydrochloric acid which had been standardized just previously against 0.1N sodium carbonate solution;

(j) methyl red solution prepared by adding 0.5 ml of 0.1N sodium hydroxide to 5 ml of 90 per cent industrial methylated spirits, dissolving in this solution 25 mgm of methyl red and diluting the resultant solution to 250 ml with 50 per cent industrial methylated spirits; and

(k) about 20 gm weighed to the nearest centigram, of the sample which has been prepared for analysis in the manner prescribed in rule 2(a) of these Rules, shall be dissolved in about 50 ml of water and filtered, the filtrate being collected in the flat bottom flask.

(2) Any insoluble matter retained in the filter shall be washed repeatedly and the combined filtrate and washing shall be made up to about 250 ml. This solution shall then be titrated from a burette of suitable capacity with the standard sodium hydroxide, using two or three drops of methyl red solution as indicator, the titration being made to the nearest 0.05 ml. The per cent free acid found in the fertilizer shall be taken as the number of millilitres and parts of a millilitre, of the standard sodium hydroxide solution used to neutralize the fertilizer solution, multiplied by 4.0 times the normality of the aforesaid standard sodium hydroxide solution and divided by the weight in grams and parts of a gram of sample taken for the analysis.

(3) Where an allowance for change in moisture content under these Rules must be made, the percentage free acid content reported shall be the percentage found divided by 100 minus the percentage moisture content of the sample determined as prescribed under these Rules and multiplied by 100 minus the percentage moisture content of the Official Sample. Otherwise the percentage found shall be the percentage reported.

13.(1) The following apparatus and reagents shall be used for the determination of biuret in a urea containing fertilizer—

(a) a laboratory spoon for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance which is sensitive to 1 mgm weight or less;

(d) a laboratory balance with a capacity of up to 500 gm which is sensitive to 1 decigram weight or less;

(e) balance weights;

(f) a hot plate with energy regulator heat control;

(g) a time piece;
(h) a water bath regulated to maintain a water temperature between 32.9°C and 33.1°C;
(i) a spectrophotometer with a monochrometer capable of being set to give a source of light with wavelength of 5500A° or a colorimeter or absorptiometer capable of being fitted with a 5400 or 5500A° or a yellow/ green light filter and with paired cells of the same optical length;
(j) a measuring cylinder 25 ml;
(k) volumetric flasks 100 and 1,000 ml, minimum specification B.S. 1972, Class B;
(l) burettes 50 ml minimum specification B.S. 846, Class B. Pipette 50 ml minimum specification B.S. 1583, Class B;
(m) a beaker 1 litre;
(n) 25 cm diameter general purpose filter papers;
(o) 40 cm diameter general purpose filter papers;
(p) a centigrade thermometer reading to 100°C in one degree units;
(q) glass rods;
(r) graph papers 1 mm rulings;
(s) approximately 0.1N sodium hydroxide or approximately 0.1N sulphuric acid as prescribed under this rule;
(t) sodium potassium tartarate solution prepared by dissolving 50.8 gm of sodium potassium tartarate tetrahydrate and 25.7 gm sodium hydroxide in water and diluting to 1 litre;
(u) a copper sulphate solution prepared by dissolving 15 gm crystalline copper sulphate in water and diluting to 1,000 ml; and
(v) pure biuret which has been dried and stored in a dessicator over anhydrous calcium chloride.

(2) A portion of the sample which has been prepared in the manner prescribed under these Rules and which is believed to contain between 0.4 and 1.2 gm of biuret shall be weighed to the nearest decigram.

(3) The portion taken shall be placed in the litre beaker, together with 700 ml of distilled water. The mixture shall be heated to 70° to 80°C with stirring and then allowed to cool to 30°C. A piece of litmus paper shall then be added and the solution shall be neutralized with the approximately 0.1N sodium hydroxide (if the paper turns red) or the approximately 0.1N sulphuric acid (if the paper turns blue) until the paper just starts to change colour. The solution shall then be filtered into the 1,000 ml volumetric flask. The residue shall be washed three times with water and the combined washings and filtrate diluted to volume.

(4) 50 ml of the samples solution so obtained shall be measured by pipette into a 100 ml volumetric flask.

(5) About 2 gm, weighed to the nearest milligram, of the pure biuret shall be treated in the manner prescribed in this rule.

(6) Into a series of six 100 ml volumetric flasks shall be measured by burette, 10.0, 14.0, 18.0, 22.0, 26.0 and 30.0 ml of the pure biuret solution so obtained. The total volume of each of the pure biuret solutions shall then be adjusted to 50 ml by suitable addition of water from a second burette.

(7) To each of these 50 ml samples of pure biuret solution and to the 50 ml aliquot of sample solution, 20 ml of the sodium potassium tartarate solution and 20 ml of the copper sulphate solution shall be added with constant swirling. The solutions shall then be diluted to volume and stood for 15 to 30 minutes in the water bath at between 32.9°C and 33.1°C while their colour develops. While the solutions are standing in the water bath the spectrophotometer shall be set to operate at 5500A° (or the colorimeter or absorptiometer shall be brought into operation as the

case may be). Then, the standing period having been completed and following the procedures which are appropriate to the operation of the instrument used, the optical densities of its cells be compared, using the coloured standard solution containing 10.0 ml of the pure biuret solution. If the comparison reveals that there is a small difference between the two cells being used, the cell with the lower optical density shall be used as the standard reference cell. The apparent optical densities of the coloured standard solutions and of the coloured sample solution relative to the coloured standard containing 10.0 ml of pure biuret solution per 100 ml shall then be determined.

(8) The apparent optical densities of the coloured standard solution shall be plotted on a calibration graph against the number of millilitres of pure biuret solution per 100 ml which they contain. The number of millilitres of pure biuret solution per 100 ml in a coloured standard solution having the same optical density as the coloured sample solution shall then be determined by interpolation on the calibration graph. The determination shall be made to the nearest millilitre.

(9) A new pure biuret solution, a new set of coloured standards prepared from it and a new calibration graph shall be prepared for each biuret determination.

(10) If the number of millilitres of pure biuret solution per 100 ml of a coloured standard solution having the same optical density as the coloured sample solution is expressed at x, and the number of grams and parts of a gram of pure biuret which was weighed out for preparing the pure biuret solution is expressed as y, the percentage biuret found in the fertilizer shall be taken as x times y multiplied by 2 and divided by the weight in grams and parts of a gram of sample taken for the analysis.

(11) Where an allowance for change in moisture content under these Rules must be made, the percentage biuret reported shall be the percentage found, divided by 100 minus the percentage moisture content of the sample determined as prescribed under these Rules and multiplied by 100 minus the percentage moisture content of the Official Sample. Otherwise the percentage found shall be the percentage reported.

14.(1) The following apparatus and reagents shall be used for the determination of salt in an animal foodstuff—

(a) a laboratory spoon for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance which is sensitive to 1 mg or less, and weights;

(d) a laboratory oven set to operate at 100°C;

(e) a laboratory furnace;

(f) a silica dish about 50 mm diameter;

(g) a porcelain mortar 8.9 to 11.5 cm outside diameter and pestle;

(h) a volumetric flask 250 ml, minimum specification B.S. 1792, Class B;

(i) pipettes 5 and 100 ml minimum specification B.S. 1583, Class B;

(j) burettes 10 ml minimum specification B.S. 846, Class B;

(k) 10 cm diameter filter funnels;

(l) 15 cm diameter general purpose 15 cm diameter rapid double acid washed filter papers;

(m) glass rods;

(n) a conical flask 250 ml;

(o) a flat bottom flask 500 ml;

(p) a wash bottle with its neck and mouthpiece insulated for handling hot liquids;

(q) calcium oxide, finely ground, free from chloride. 0.1N silver nitrate standardized against 0.1N sodium chloride (which contains 5.846 grams pure sodium chloride per litre);

(r) 0.1N ammonium or potassium thiocyanate standardized against the 0.1N silver nitrate;

(s) dilute nitric acid, prepared by adding 1 part of concentrated nitric acid to 4 parts of water;

(t) clarified nitric acid solution prepared by diluting concentrated nitric acid with about 1/4 of its volume of water and boiling until practically colourless; and

(u) ferric indicator solution, prepared by adding 5 ml of concentrated nitric acid to 100 ml of saturated aqueous ferric ammonium sulphate.

(2) About 5 gm weighed to the nearest milligram of the sample which has been prepared in the manner prescribed under these Rules shall be placed in the silica dish. 1 gm of the calcium oxide shall then be added and shall be mixed with the sample and the mixture shall be wetted with water to a thick paste. The mixture shall be dried in the oven, allowed to cool and then ground to a fine powder and shall then be heated gently and finally incinerated in the furnace until all the organic matter has been thoroughly charred, but the temperature in the furnace during that time shall not be allowed to exceed 500°C.

(3) The residue shall then be extracted with repeated portions of hot water and filtered through a general filter paper. The filtrate shall be cooled and diluted to volume in a 250 ml volumetric flask. 100 ml of this solution shall be measured by pipette into the conical flask and acidified with the dilute nitric acid. A known volume of the 0.1N silver nitrate solution shall then be measured into the solution in the conical flask from a burette, the silver nitrate solution being added until no further precipitate is formed and a slight excess of silver nitrate is present. The volume of 0.1N silver nitrate added shall be measured to the nearest 0.1 ml. The precipitate shall then be stirred well, filtered through a rapid filter paper into the flat bottom flask and washed thoroughly. 5 ml measured by pipette, of the ferric indicator solution and a few millilitres of the clarified nitric acid solution shall then be added to the combined filtrate and washings in the flat bottom flask. The excess of the silver nitrate remaining in the filtrate shall then be determined by titration with 0.1N ammonium or potassium thiocyanate from a burette until a permanent light brown colour appears. The titration shall be made to the nearest 0.1 ml.

(4) If the number of millilitres and parts of a millilitre of 0.1N silver nitrate added to the solution in the conical flask is expressed as x and if the number of millilitres and parts of a millilitre of 0.1N thiocyanate solution used in the titration to determine the excess of silver nitrate is expressed as y, the percentage salt found be taken as x-y multiplied by 1.461 and divided by the weight in grams and parts of a gram of sample taken for the analysis.

(5) Where an allowance for change in moisture content under these Rules must be made, the percentage salt reported shall be the percentage found, divided by 100 minus the percentage moisture content of the sample determined as prescribed under these Rules and multiplied by 100 minus the percentage moisture content of the Official Sample. Otherwise the percentage found shall be the percentage reported.

15(1) The following apparatus and reagents shall be used for the determination of ash, sand, silicious material and other insoluble mineral matter in an animal foodstuff—

(a) a laboratory spoon for drawing the sample;

(b) a weighing bottle or boat;

(c) a laboratory balance which is sensitive to 1 mg or less, and weights;

(d) a hot plate with an energy regulator heat control;

(e) a laboratory furnace;

(f) silica capsules or dishes about 55 mm diameter;

(g) an 11 cm diameter funnel;

(h) 7 cm diameter general purpose ashless filter papers; wash bottles with their necks and mouth-pieces insulated for handling hot liquids;

(i) glass rods;

(j) concentrated hydrochloric acid; and

(k) dilute hydrochloric acid, prepared by diluting 240 ml of concentrated hydrochloric acid with water to 1 litre.

(2) Between 2 and 5 g weighed to the nearest milligram of the sample which has been prepared in the manner prescribed under these Rules shall be placed in a silica capsule or dish and shall then be heated gently and finally incinerated in the furnace until all the carbon has been destroyed but the temperature in the furnace during that time shall not be allowed to exceed 500°C. The ash shall then be cooled and moistened with the concentrated hydrochloric acid. The moist ash shall then be evaporated to dryness and baked on the hot plate. The dried ash shall then be extracted repeatedly with the hot dilute hydrochloric acid. The extract each time shall be decanted through a filter paper in the filter funnel. After the extraction has been completed, the residue shall be transferred to the aforesaid filter paper in the filter funnel and shall be washed thoroughly with hot water. The filter paper and the residue it contains shall then be placed in a silica capsule or dish whose weight is known to the nearest milligram. These shall be dried in the oven, and shall then be heated gently and finally incinerated in the furnace until all the carbon is destroyed, but the temperature in the furnace during that time shall not be allowed to exceed 500°C. The silica capsule and the ash it contains shall be allowed to cool and shall be reweighed, the weight being determined to the nearest milligram. The percentage of sand, silicious matter and other insoluble mineral material found shall be taken as the weight in milligrams of ash so found, multiplied by 100 and divided by the weight in milligrams of samples taken for analysis.

(3) Where an allowance for change in moisture content under these Rules must be made, the percentage of sand, silicious material and other insoluble matter reported shall be the percentage found, divided by 100 minus the percentage moisture content of the sample determined as prescribed under these Rules and multiplied by 100 minus the percentage moisture content of the Official Sample. Otherwise the percentage found shall be the percentage reported.

15A. (1) The following reagents shall be used for the determination of sugar in an animal foodstuff—

(a) Potassium oxalate solution—dissolve 50 g of potassium oxalate in water and dilute to 1 litre.

(b) Zinc acetate solution—dissolve 219 g of crystallized zinc acetate and 30 ml of glacial acetic acid in water and dilute to 1 litre.

(c) Potassium ferrocyanide solution—dissolve 106 g of crystallized potassium ferrocyanide in water and dilute to 1 litre.

(d) N. hydrochloric acid.

(e) Phenolphthalein indicator solution—dissolve 250 mg of phenolphthalein in 150 ml of industrial methylated spirit and dilute with water to 250 ml.

(f) 10 per cent sodium hydroxide solution—dissolve 100 g of sodium hydroxide in water and dilute to 1 litre.

(g) Fehling's solution—mix equal volumes of a solution of copper sulphate and a solution of sodium potassium tartrate prepared as follows—

Copper sulphate solution—dissolve 69.28 g of copper sulphate (CuSO45H2O) in water and dilute to 1 litre.

The strength of the Fehling's solution should be such that 10 ml is equivalent to 0.0525 g of invert sugar. It should be checked by titrating with a solution of pure sucrose inverted by, and using, the procedure described in subparagraph (f) of subrule (2) of this rule.

(h) Sodium potassium tartrate solution—dissolve 346 g of sodium potassium tartrate and 100 g of sodium hydroxide in water and dilute to 1 litre.

(i) Methylene blue solution—dissolve 2.5 g of methylene blue in water and dilute to 250 ml.

(2) The following procedure and apparatus shall be used for the determination of sugar in an animal foodstuff—

(a) When the substance is in solid form weigh to the nearest centigram about 20 g of the sample or a sufficient quantity to contain about 2 g of sugar. Grind in a mortar with hot water (temperature not to exceed 60°C.) and transfer with the aid of water to a 250 ml beaker using in all about 120 ml of water. Stir well and decant through muslin into a 250 ml volumetric flask, allowing to drain until the liquid is substantially removed, and then squeeze the residue on the muslin. Return the residue to the beaker, add about 50 ml of water, mix and decant through the muslin into the volumetric flask, again squeezing the residue after draining. Repeat this treatment with a further 50 ml of water, and finally squeeze the residue on the muslin. Add 5 ml of potassium oxalate solution to the contents of the volumetric flask followed by 5 ml of zinc acetate solution; mix well and then add 5 ml of potassium ferrocyanide solution, dilute to 250 ml, mix well and filter. Determine the sugar in 50 ml of the filtrate by the procedure described in subparagraph (c) of this paragraph.

(b) When the substance is in liquid form weigh to the nearest mg about 5 g of the sample and wash with water into a 250 ml volumetric flask using about 200 ml of water. To clear the solution add 5 ml of zinc acetate solution. Mix, dilute to 250 ml of potassium ferrocyanide solution, again mix, dilute to 250 ml, mix and filter. Determine the sugar in 25 ml of the filtrate by the procedure described in subparagraph (c) of this paragraph.

(c) In order to determine the sugar content transfer the measured volume of filtrate obtained as described in subparagraph (a) or (b) of this paragraph to a 300 ml beaker, add 15 ml of N. hydrochloric acid, dilute to 150 ml with water, cover with a glass and heat to boiling point. Continue to boil for 2 minutes, cool, add 2 or 3 drops of phenolphthalein indicator solution, just neutralize with 10 per cent sodium hydroxide solution, transfer to a 200 ml volumetric flask and dilute to 200 ml. Filter if necessary.

(d) A preliminary estimation is usually necessary where the percentage of sugar is unknown, in which case transfer exactly 10 ml of Fehling's solution to a 250 ml conical flask and add 20 ml of water. Add from a burette approximately 10 ml of the filtrate obtained as described in subparagraph (c) of this paragraph, heat to boiling point, and boil briskly for 1 minute. Add 3 drops of methylene blue solution and titrate from the burette at the rate of 1 ml per 15 seconds until the blue colour is discharged, the contents of the flask being kept boiling throughout the titration. Note the total number of ml required and call this Xml. This titration should not be outside the range of 15-40 ml otherwise the determination should be repeated using a more appropriate volume of the filtrate.

(e) To achieve an exact determination proceed as follows: To 10 ml of Fehling's solution in a 250 ml conical flask add, from a burette, (X-1) ml of the filtrate obtained as described in subparagraph (c) of this paragraph together with sufficient water to make a total volume of 60 ml. Heat to boiling point, boil briskly for 1½ minutes and add 3 drops of methylene blue solution. Titrate from the burette at the rate of approximately 0.25 ml per 15 seconds until the blue colour is discharged, the contents of the flask being kept boiling briskly throughout the titration which must not take more than 1½ minutes. Then the total number of mil. used in the determination equals the sugar equivalent of 10 ml of Fehling's solution. 10 ml Fehling's solution = 0.0525 g invert sugar. Not more than 1 ml of the filtrate should be required for the completion of the titration. If more than 1 ml is required, then the determination should be repeated using a more closely calculated volume of filtrate for the original addition. The time taken from the initial boiling point until the end of the titration

should be about 3 minutes. If this time is exceeded by more than 20 seconds, the titration should be repeated.

(f) The Fehling's solution shall be standardized as follows: Dissolve 2.375 g sucrose (dried at 100°C) in about 100 ml of water in a 300 ml beaker, add 15 ml of N. hydrochloric acid and sufficient water to give a volume of 150 ml. Heat to boiling point, boil for 2 minutes, cool, add 2 or 3 drops of phenolphthalein solution, just neutralize with 10 per cent sodium hydroxide solution, transfer to a 500 ml volumetric flask and dilute to 500 ml. Then follow the procedure described in subparagraph (e) of this paragraph. 1 ml of this solution = 0.00475 g sucrose = 0.005 g invert sugar, i.e. 10 ml of Fehling's solution = 10.5 ml of this standard invert sugar solution. The total copper reducing power should finally be determined in terms of sugar ($C_{12}H_{22}O_{11}$).

[L.N. 292/1974.]

16. The Certificate of Analysis issued under these Rules shall be in the form set out in the Schedule to these Rules.

17. The Analyst shall report in this Certificate the percentage, to the first decimal place, of each of the constituents of an Official Sample which an inspector, in pursuance of rule 21 of the Fertilizers and Animal Foodstuffs (Sampling) Rules, 1972, shall have stated (in the Certificate he affixed to the container or package containing that sample) in addition to the particulars printed or marked in accordance with the requirements of rule 3 of the Fertilizers and Animal Foodstuffs (Packing of Approved Fertilizers) Rules, 1972 (L.N. 210/1972), or rule 4 of the Fertilizers and Animal Foodstuffs (Packing of Approved Animal Foodstuffs) Rules, 1972 (L.N. 212/1972), on the containers or packages from which the Official Sample was drawn or on the labels attached to those containers. Where the Official Sample is stated to be drawn from packages or containers marked or labelled as being Sulphate of ammonia, he shall also report the percentage of free acid. Where the animal foodstuff from which the Official Sample was drawn is sold for poultry mash he shall also report the percentage of salt. Where he finds the Official Sample to contain any deleterious substance whatsoever, he shall report on its presence. Where the Official Sample is an animal foodstuff and where he suspects deleterious proportions of sand, silicious matter or other insoluble matter to be present, he shall also report the total percentage of these materials.

18. The Analyst shall send copies of the Certificate of Analysis of each Official Sample which he analyses to the Inspector who drew the sample, to the person in possession of the fertilizer or animal foodstuff at the time the sample was taken, and also to the person, if any, under whose instructions the sample was collected and to the person who last sold the fertilizer or animal foodstuff.

19. The aforesaid analysis may be undertaken under the supervision of an Analyst by any person or persons whom the said Analyst shall instruct to undertake the analysis but the Certificate of Analysis shall be signed and certified only by an Analyst appointed by the Minister under section 8 of the Act.

SCHEDULE

[r. 15]

CERTIFICATE OF ANALYSIS

[1] ..... duly appointed by *Gazette* Notice No. [2] ..... to be an analyst under the

Fertilizers and Animal Foodstuffs Act, hereby certify that a sample in a sealed container to which was attached a certificate on which was included the following information concerning the sample[3] —

The name and full postal and business addresses of the manufacturer where known and of the seller or the person who was in possession of the fertilizer and animal foodstuff at the time the sample was taken:

.....

The name of the fertilizer or animal foodstuff:

.....

The analysis guaranteed by the manufacturer or seller:

The name and full postal address of the Inspector who took the sample:

.....

The name and full postal and business address of the person, if any, under whose instructions the sample was taken:

.....

The date and place at which the sample was taken:

.....

Other identifying marks or particulars:

.....

has been analysed by me or under my direction and I declare the result of the analysis to be as follows—

Moisture by [4], [5] ..... %

Nitrogen ..... Total ..... %

Phosphoric acid as —

P^2O^5 — water soluble ..... %

soluble in 2 per cent citric acid ..... %

soluble in mineral acid or total ..... %

Material passing through Standard Test sieve

B.S. 410, having apertures (Minimum

Specification) [5] ..... mm. square—

Oil ..... %

Fibre ..... %

Biuret ..... %

Sodium Chloride ..... %

Sand, silicious and other insoluble

mineral matter ..... %

Other analysis and remarks (if any)—

[7] ..... %

The analyses were made in accordance with the methods prescribed by the Fertilizers and Animal Foodstuffs (Analysis) Rules, 1972.

Witnessed under my hand this ..... day of ....., 19 .....

Signature .....

Address of Analyst .....

[1] Here insert the name of the analyst signing the Certificate and the capacity in which he acts in undertaking the analysis.

[2] Here insert the particulars of the *Gazette* Notice under which the analyst signing the Certificate was appointed an Analyst under the Fertilizers and Animal Foodstuffs Act.

[3] Here insert full particulars taken from the Certificate affixed to the container containing the Official Sample whose analysis is here reported for the Fertilizer or Animal Foodstuff whence the Official Sample was drawn to be recognized.

[4] Here report the moisture content and those particulars in respect of which a specification is laid down or guarantee required and given under the Fertilizers and Animal Foodstuffs Act, in respect of the fertilizer or animal foodstuff whose analysis is here reported.

The result of the analysis shall be reported to the first decimal point.

[5] Here state the drying procedure followed in the determination.

[6] Here state the apperture size of the Standard Test Sieve that was used and that was required to be used in determining the percentage of material passing through the Standard Test Sieve.

[7]Here report the presence of deleterious substance.

THE FERTILIZERS AND ANIMAL FOODSTUFFS (APPROVED ANIMAL FOODSTUFFS) RULES

[Legal Notice 211 of 1972]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Approved Animal Foodstuffs) Rules.

2. The animal foodstuffs specified in the first column of Part I of the Schedule hereto and having the implied definitions shown in the second column of Part I of the said Schedule and having the characteristics specified in Part II of the said Schedule, are hereby prescribed to be approved animal foodstuffs:

Provided that an animal foodstuff shall be deemed to have complied with the requirements of the analysis guaranteed by the vendor if it is not deficient in any of its ingredients within the limits of variation specified in Part II of the Schedule hereto.

SCHEDULE

[r. 2]

PART I

Animal Foodstuff	*Implied Definition*
Alfalfa (lucerne) Meal 1	Alfalfa (lucerne), as grown, dried and ground, to which no other matter has been added.
Barley	Commercially pure barley, as grown.
Barley meal	The meal obtained by grinding barley, as grown, which shall be the whole grain together with only such other substance as may reasonably be expected to have become associated with the grain in the field and which contains not less than 96 per cent pure barley.
Barley meal, Grade II	The meal, other than barley meal as defined, contained by grinding barley, as grown, which shall be the whole grain together with only such other substances as may reasonably be expected to have become associated with the grain in the field and which contains not less than 99 per cent pure barley.

Bean meal	The meal obtained by grinding commercially pure beans of the species (1) *Vicia faba* (synonym *faba vulgaris*) or any of its varieties, commonly known as "horse bean", "field bean", or "broad bean", or (2) *Phaseolus vulgaris* the "true haricot bean" or any of its varieties, white or coloured, or (3) dolichos lablab, the dolichos, lablab or njahi bean or (4) *Stizolobium* or *Mucuna* species the valvet beans.
Cassava	The commercially pure dried peeled root of the cassava plant.
Cassava meal	The meal obtained by grinding the commercially pure dried peeled root of cassava.
Clover meal	Whole clover, as grown, dried and ground to which no other matter has been added.
Compound cakes or meals	Cake or meals consisting of a mixture of two or more of the articles mentioned in column 1.
Cotton cakes or meals not decorticated	The residue resulting from the removal of oil from commercially pure cotton seed, not decorticated.
Cotton cakes or meals from decorticated or partly decorticated cotton seed	The residue resulting from the removal of oil from commercially pure cotton seed from which the cortex, in whole or in part, has been removed.
Dried brewery grains	The article produced by drying the residue of malted and unmalted cereals used in brewing, to which no other matter has been added.
Dried distillery grains	The article produced by drying the residue from distillery mashtuns, to

	which no other matter has been added.
Dried green fodder crops	Any product which is obtained by artificially drying any green crop or crops suitable for use as dried fodder for cattle, pigs or poultry and is otherwise as grown (that is to say including any growths harvested there with but with no other substance added thereto), and
(i) High quality	Contains not less than 13 per cent protein calculated on the assumption that it contains 10 per cent moisture
(ii) Medium quality	Contains less than 13 per cent protein but not less than 10 per cent protein calculated on the assumption that it contains 10 per cent moisture.
(iii) Maintenance quality ..	Contains less than 10 per cent protein calculated on the assumption that it contains 10 per cent moisture.
Dried Yeast	An article produced by drying yeast or yeast residues, to which no other matter has been added.
Extracted linseed meal	The residue resulting from the removal of oil from commercially pure linseed by means of a solvent.
Feeding bone flour	The produce obtained by grinding commercially pure steamed bone.
Feeding dried blood	Blood which has been dried, to which no other matter has been added.
Feeding meat and bone meal, carcass meal	The product, containing not less than 40 per cent of protein and not more than 4 per cent of salt obtained by drying and grinding animal carcasses or portions

	thereof (excluding hoof and horn) and bone, to which no other matter has been added, but which may have been preliminarily treated for the removal of fat.
Feeding meat meal	The product, containing not less than 55 per cent of protein and not more than 4 per cent of salt, obtained by drying and grinding animal carcasses or portions thereof (excluding hoof and horn) which may have been preliminarily treated for the removal of fat.
Fish meal, fish residue meal	A product obtained by drying and grinding or otherwise treating fish or waste of fish, to which no other matter has been added.
Flaked maize	The product obtained by cooking and flaking commercially pure maize or Indian corn, either as grown or from which the germ, in whole or in part, has been removed.
Ground or crushed oats	The meal obtained by grinding or crushing commercially pure oats, as grown.
Linseed cakes or the meals of such cakes	The residue resulting from the removal of oil from commercially pure linseed or the meal obtained by grinding or crushing commercially pure linseed.
Liver meal	The meal obtained by drying and grinding animal livers which may have been preliminarily treated for the removal of fat or oil.
Locust bean meal	The meal obtained by grinding or crushing commercially pure locust beans.

Maize	Commercially pure maize, as grown.
Maize germ cake or meal.....	A meal or cake resulting from the grinding of maize germs or of maize germs from which the oil has been removed in whole or part.
Maize-gluten feed	A by-product resulting from the removal of starch and germ from maize, to which no matter has been added.
Maize meal	The meal obtained by grinding commercially pure maize as grown.
Malt columns	The rootlets and shoots arising from the screening of malt, to which no other matter has been added.
Mineral feeding supplements	Any minerals stocklick or substance which could be used a stocklick which is alleged to posses nutritive properties but shall not apply to supplements not containing phosphoric acid.
Nut cakes or meal including coconut, copra, palm kernel and ground nut cakes and meals	The residue resulting from the removal of oil from commercially pure nut kernels.
Oats	Commercially pure oats as grown.
Oat feed	The by-product of oatmeal milling consisting of hulls, floury materials, mealy matter, screen dust, all finely ground and containing no more than 27 per cent of fibre.
Pea meal	The meal obtained by grinding commercially pure peas, as grown, of varieties of *Pisum sativum* or *Pisum arvense*, or the varieties of *Vignacatiang* "cow" peas, or the varieties of *Cajanus,* "pigeon" peas.

Pyrethrum marc	The steamed, dried residue from the extraction of dried, ground pyrethrum *Chrysanthemum cinerariijolium* flowers with a light petroleum solvent.
Rape cake or meal	The residue resulting from the removal of oil from commercially pure rape seed.
Rice bran, rice meal	The by-product produced in milling shelled rice to which no other matter has been added.
Sorghum: dari: durra	Commercially pure sorghum (dari: durra) as grown.
Sorghum meal (dari or durra meal)	The meal obtained by grinding commercially pure sorghum (dari: durra) as grown.
Soya cake or meal	The residue resulting form the removal of oil from commercially pure soya beans.
Sugar-beet treacle; sugar-beet molasses	A concentrated syrup product obtained in the manufacture of sugar from sugar-beet to which no other matter has been added.
Sugar-cane treacle; sugar-cane molasses	A concentrated syrup product obtained in the manufacture of sugar from sugarcane to which no matter has been added
Sunflower seed cakes or meal not decorticated	The residue resulting from the removal of oil from commercially pure sunflower seed, not decorticated.
Sunflower seed cakes or meal from decorticated or partly decorticated sunflower seed	The residue resulting from the removal of oil from commercially pure sunflower seed from which the cortex in whole or in part, has been removed.
Wheat	Commercially pure wheat, as grown.

Wheat germ	A meal or cake resulting from grinding of wheat germs.
Wheat meal	The meal obtained by grinding commercially pure wheat, as grown.
Wheat offals, millers' offals	A product of wheat separated in the process of milling and containing no more than 4 per cent of vegetable substances other than wheat, extracted from wheat in the process of cleaning by the maker of the offals in the production of flow.
White fish meal	A product (containing not more than 6 per cent of oil and not more than 4 per cent of salt) obtained by the drying and grinding or otherwise treating white fish or waste of white fish to which no other matter has been added.
Dried beet pulp	The article produced by drying the sugar beet residue produced in manufacture of sugar from sugar-beet, with or without the addition of molasses.

(The term "commercially pure" mentioned in this Legal Notice, implies that no other matter may be added.)

PART II

Particulars of composition to be contained in statutory statement

Particulars of composition to be contained in statutory statement

	LIMITATIONS OF VARIATION (Percentages are percentages of the whole bulk)
(a) None:	
Barley	
Barley meal	
Barley meal (Grade II)	
Bean meal	
Cassava	
Cassava meal	

Ground or crushed oats	
Locust bean meal	
Maize	
Maize meal	
Oats	
Pea meal	
Pyrethrum marc	
Wheat	
Wheat meal	
(b) Amount of fibre:	
Dried plain beet pulp	Fibre, 1 per cent or 1/8th of the amount stated whichever is the greater.
Oatmeal by-products	Fibre, 1 per cent or 1/8th of the amount stated whichever is the greater provided that the name "oat feed" shall not be applied to any article containing more than 27 per cent of fibre.
Wheat offals or millers' offals	Fibre, 1 per cent or 1/8th of the amount stated whichever is the greater; if the actual amount is less than that stated one-half the amount stated.
(c) Amount of oil:	
Linseed meal	Oil, 0.75 per cent or 1/10th of the amount stated, whichever is the greater.
(d) *Amount of protein:*	
Dried green fodder crops high quality.	Protein, 1/10th of the amount stated provided that the name "dried grass" shall not be applied to any article containing less than 13 per cent protein or the names "dried grass (maintenance)" or "dried green fodder crop" to any articles containing less than 10 per cent protein.
Medium quality maintenance quality.	
Dried yeast feeding dried blood ..	Protein, 1/10th of the amount stated or 4 per cent whichever is the less.
(e) Amount of fibre and protein respectively:	
Clovermeal	Protein, 1/10th of the amount stated fibre, 1/8th of the amount stated.
Lucerne (alfalfa) meal.....	Protein,1/5th of the amount stated
Malt culms	Fibre, 1 per cent or 1/8th of the amount stated, whichever is greater.
(f) Amounts of oil and protein respectively:	
Coconut or copra cake or meal	Oil, 0.75 per cent or 1/10th of the amount stated, whichever is the greater.
Cotton cakes or meal not decorticated.	Protein, 1/10th of the amount stated.
Sunflower cakes or meal not decorticated.	

Oil cakes or meal not otherwise specifically mentioned in this Schedule which are the product of any one under-corticated substance of seed from which oil has been removed.	Oil, 0.75 per cent or 1/8th of the amount stated, whichever is the greater.
	Protein, 1/10th of the amount stated.
Liver meal, palm kernel cake or meal linseed cakes and the meal of such cakes; extracted linseed meal; maize flaked; maize germ cake or meal; maize gluten feed; rape cake or meal; soya cake or meal.	Oil, 0.75 per cent or 1/5th of the amount stated whichever is the greater. Protein, 1/8th of the amount stated.
Wheat germ.	Oil, 0.75 per cent or #th of the amount stated
Dried brewery and distillery grains	whichever is the greater. Protein, ⅛th of the amount stated.
(g) Amounts of protein and phosphoric acid respectively:	
Feeding bone flour ..	Phosphoric acid, 1/20th of the amount stated.
	Protein, 1/10th of the amount stated.
Feeding bone meal, ground bone or any other bone product for feeding purposes.	Phosphoric acid, 1/10th of the amount stated. Protein, 1/10th of the amount stated.
(h) Amount of calcium oxide; phosphoric acid and salt;	
Mineral feeding supplements	Calcium oxide, 1/20th of the amount stated. Phosphoric acid, 1/20th of the amount stated. Salt, 1/20th of the amount stated.
(i) Amount of oil, protein and phosphoric acid respectively:	
Feeding meat, bone meal or any other product of meat and bone for feeding purposes.	Oil, 0.75 per cent or 1/10th of the amount stated whichever is the greater. Protein, 1/10th of the amount stated.
Feeding meat meal or any other product of meat for feeding purposes	Phosphoric acid, 1/10th of the amount stated. Provided that the names "feeding meat meal" and "feeding meat and bone meal" shall not be applied to articles containing less than 55 per cent and less than 40 per cent of protein respectively.
(j) Amounts of oil, protein and fibre respectively:	
Compound cakes or meal consisting of admixture of two or more of the articles mentioned in this Legal Notice.	Oil, 0.75 per cent or 1/10th of the amount stated. whichever is the greater. Protein, 1/10th of the amount stated. Fibre, 1 per cent or 1/10th of the amount stated, whichever is the greater; if the actual amount is less than that stated, one-half of the amount stated.

Cotton cakes or meal from decorticated or partly decorticated cotton seed.	
Maize by-products not otherwise specifically mentioned in this Legal Notice. Oil cakes or meal not otherwise specifically mentioned in this Notice which are the product of any one decorticated or partly decorticated substance or seed from which oil has been removed.	Oil, 0.75 per cent or 1/10th of the amount stated, whichever is the greater. Protein, 1/10th of the amount stated. Fibre, 1 per cent or 1/10th of the amount stated, whichever is greater the greater.
Rice bran or rice meal or the by-product produced in milling shelled rice.	
Sunflower cakes or meal decorticated or partly decorticated.	

(k) Amount of oil. protein phosphoric acid and salt respectively:

Fish meal, white fish meal or other product obtained by grinding or otherwise treating fish or fish waste.	Oil, 0.75 per cent or 1/10th of the amount stated, whichever is the greater. Protein, 1/10th of the amount stated. Phosphoric amount stated. Salt, 0.75 per cent: Provided that the names "white fish meal" shall not be applied to any article containing more than 6 per cent oil or 4 per cent salt.

(l) Sugar

Molasses	Sugar 1/10th of the amount stated.
Molasses feeds containing not less than 10 per cent sugar.	

The amount, in each case, shall be stated as a definite percentage of the weight of the articles.

Phosphoric acid shall be stated in terms of phosphoric anhydride (P_2O_5).

The amount of protein stated shall be the amount of nitrogen, other than ammonia or nitric nitrogen multiplied by 6.25 or, in the case of pure wheat products, by 5.70.

THE FERTILIZERS AND ANIMAL FOODSTUFFS (APPROVED FERTILIZERS) RULES

[Legal Notice 209 of 1972]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Approved Fertilizers) Rules.

2. The substances or mixture of substances specified in the first column of the Schedule hereto which have the implied definitions shown in the second column of the said Schedule are hereby prescribed to be approved fertilizers.

SCHEDULE

Approved Fertilizer	*Implied Definition*
Sulphate of Ammonia	Ammonium sulphate for fertilizing purposes.
Nitrate of soda	Sodium nitrate for fertilizing purposes
Calcium Ammonium Nitrate	Mixtures of ammonium nitrate and calcium carbonate for fertilizing purposes.
Ammonium Sulphate Nitrate	Mixtures of ammonium sulphate and ammonium nitrate for fertilizing purposes.
Urea	Urea for fertilizing purposes.
Diammonium Phosphate	Diammonium hydrogen orthophosphate for fertilizing purposes.
Superphosphate or supers	Phosphate rock which has been treated with sulphuric acid or phosphoric acid for fertilizing purposes.
Triple superphosphate	Phosphate rock which has been treated with phosphoric acid only.
Basic Slag	A by-product containing phosphorus for fertilizing purposes obtained in the manufacture of steel.
Soda phosphate	Phosphatic rock which has been strongly heated with sodium sesqui-carbonate for fertilizing purposes.
Rock phosphate	Crude mineral calcium phosphate for fertilizing purposes.
Guano.....	The crude residues of past and present nesting, breeding and rooting colonies of sea-fowl and bats and the phosphate enriched rocks, sands and clays associated with the site of these colonies.
Zinc oxide	Zinc oxide specially prepared for fertilizing purposes.
Copper oxide	Copper oxide when used for fertilizing purposes.
Copper oxychloride	Copper oxychloride when used for fertilizing purposes.
Bonemeal	Commercially pure bone which has been ground or crushed for fertilizing purposes.
Muriate of potash	Potassium chloride for fertilizing purposes.

Sulphate of potash	Potassium sulphate for fertilizing purposes.
Magnesium sulphate.....	Magnesium sulphate hapta hydrate for fertilizing purposes.
Kieserite	Magnesium sulphate monohydrate for fertilizing purposes.
Magnesia	Calcined crude mineral magnesium carbonate for fertilizing purposes.
Magnesite	Partly calcined crude mineral magnesium carbonate for fertilizing purposes.
Copper sulphate	Copper sulphate for fertilizing purposes.
Borax	Sodium tetraborate for fertilizing purposes.
Ground limestone	Ground predominantly calcium carbonate mineral for liming agricultural land.
Burnt lime	Calcined predominantly calcium carbonate mineral for liming agricultural land.
Compound or Complex Fertilizer	Specially compounded mixtures or substances for fertilizing purposes which are sold by virtue of their content of more than one fertilizer nutrient element and in respect of which the vendor gives guarantees under the Fertilizer and Animal Foodstuffs (Declaration and Warranty) Rules, (L.N. 216/1972).

(The term "commercially pure" mentioned in this Notice, implies that no other matter may be added.)

THE FERTILIZERS AND ANIMAL FOODSTUFFS (DECLARATION AND WARRANTY) RULES

[Legal Notice 216 of 1972]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules.

2. Every vendor of any approved fertilizers shall provide a purchaser with a written declaration and warranty in respect of any sale involving 500 kg or more of any one kind of an approved fertilizer, or in respect of any sale of an approved fertilizer for resale purposes.

3. (1) Every declaration and warranty required to be given by a vendor to a purchaser under rule 2 of these Rules shall be in the following form—

"I (i) ..... of ..... hereby declare and give warranty as follows in respect of the following approved fertilizer/s which I have sold to (ii) ..... of ....."

(2) In addition to the declaration and warranty required to be given by vendor under rule 2 of these Rules, the vendor shall in respect of each kind of approved fertilizer involved in the transaction make a separate declaration in writing as follows—

"That the packages or containers marked (iii) ..... contain (iv) ..... tonnes ..... and ..... kilogrammes of (v) ..... and that I guarantee that this fertilizer is not adulterated."

(3) Where the vendor is selling an approved fertilizer partly or wholly by virtue of the contents of its constituents in respect of which he is required to make a declaration and warranty under rule 5 of these Rules, he shall in addition give to the purchaser the following guarantee—

"Furthermore I guarantee that this fertilizer contains (vi) ..... of (vii) ..... per cent of (viii) .....".

4. (1) Every vendor shall complete the declaration and warranty by appending his signature at the end thereof.

(2) In the declaration and warranty, the vendor shall insert in the spaces kept blank for the purpose of the following particulars—

(a) at (i) his own name and full postal address;

(b) at (ii) the name and full postal address of the purchaser;

(c) at (iii) sufficient detail of the marks on the containers or packages in which the approved fertilizer is packed or particulars shown on the labels attached thereto;

(d) at (iv) the weight of the approved fertilizer contained in the containers or packages in tonnes and kilogrammes as the case may be;

(e) at (v) the name under which the fertilizer is prescribed to be an approved fertilizer under the Fertilizers and Animal Foodstuffs (Approved Fertilizers) Rules, 1972 (L.N. 209/1972);

(f) at (vi) the words "minimum" or "maximum" as the case may be of the percentage of the constituents which he is required to guarantee under rule 5 of these Rules;

(g) at (vii) the minimum or the maximum percentage as the case may be of the aforesaid constituent which he is required to guarantee under rule 5 of these Rules;

(h) at (viii) the name of the aforesaid constituent and if the constituent is nitrogen in a compound fertilizer he shall add the words "and that the nitrogen is present in the form of", and he shall then add the words "ammonium nitrogen", "nitrate nitrogen", "organic nitrogen", or such

combination of these words as is appropriate to describe the form in which the nitrogen is present in the said compound fertilizer.

5. In making this declaration and warranty—

(a) if the approved fertilizer is Superphosphate or supers the vendor shall declare the minimum percentage of water soluble phosphorus pentoxide which he guarantees the fertilizer to contain;

(b) if the approved fertilizer is Soda phosphate, the vendor shall declare the minimum percentage of phosphorus pentoxide which is soluble in 2 per cent citric acid which he guarantees the fertilizer to contain;

(c) if the approved fertilizer is Basic Slag, the vendor shall declare the minimum percentage of phosphorus pentoxide which is soluble in 2 per cent citric acid which he guarantees the fertilizer to contain and the minimum percentage of fertilizer which he guarantees will pass through a Standard Test Sieve (minimum specification B.S. 410), having apertures not greater than 0.152 mm sq.;

(d) if the approved fertilizer is Rock Phosphate, Guano or Bonemeal, the vendor shall declare the minimum percentage of phosphorus pentoxide which is soluble in mineral acid which he guarantees the fertilizer to contain;

(e) if the approved fertilizer is or containing compound fertilizer the vendor shall declare the minimum percentage of nitrogen and the maximum percentage of biuret which he guarantees the fertilizer to contain;

(f) if the approved fertilizer is Sulphate of Ammonia, the vendor shall guarantee that the fertilizer contains at least 20 per cent nitrogen and, if the free acid content is in excess of 0.03 per cent, he shall declare the maximum amount of free acid which he guarantees the fertilizer to contain;

(g) if the approved fertilizer is Calcium Ammonium Nitrate, the vendor shall guarantee that the fertilizer contains at least 20 per cent nitrogen;

(h) if the approved fertilizer is Ammonium Sulphate Nitrate, the vendor shall guarantee that the fertilizer contains at least 25 per cent nitrogen;

(i) if the approved fertilizer is Nitrate of soda, the vendor shall guarantee that the fertilizer contains at least 15 per cent nitrogen;

(j) if the approved fertilizer is Diammonium Phosphate, the vendor shall declare the minimum percentage of nitrogen and the minimum percentage of water soluble phosphorus pentoxide which he guarantees the fertilizer to contain;

(k) if the approved fertilizer is a compound fertilizer the vendor shall declare the minimum percentage of nitrogen and or water soluble phosphorus pentoxide or a phosphorus pentoxide which is soluble in 2 per cent citric acid or mineral acid which he guarantees the fertilizer to contain and shall state in the manner prescribed under paragraph (h) of rule 4 of these Rules the form or forms in which the nitrogen it contains is present.

6. The minimum or maximum percentage, as the case may be of the constituents which the vendor is required to guarantee under rule 5 of these Rules shall be as determined in the manner prescribed under the Fertilizers and Animal Foodstuffs (Analysis) Rules, 1972 (L.N. 215/1972), on samples taken in the manner prescribed under the Fertilizers and Animal Foodstuffs (Sampling) Rules, 1972 (L.N. 214/1972).

7. The completion of any transaction involving the sale of any quantity of any approved fertilizer shall imply that the vendor has made a declaration and warranty to the purchaser in terms laid down by these Rules.

8. Any person who sells any approved animal foodstuffs shall clearly, conspicuously and indelibly mark on or affix to the container in which the animal foodstuff is sold, the particulars required in paragraphs (a), (b), (c) and (d) of this rule or shall, provide the purchaser with a

written declaration at the time of sale or within a reasonable time after the animal foodstuff is delivered containing the following particulars—

(a) the seller's name and full postal and business addresses;

(b) the name of the animal foodstuff sold;

(c) the guaranteed analysis expressed to the first decimal place of the animal foodstuff in respect of the constituents for which guarantees are required under the Fertilizers and Animal Foodstuffs (Approved Animal Foodstuffs) Rules, 1972 (L.N. 211/1972);

(d) the means for identifying the animal foodstuff covered by the declaration:

Provided that for the sale of quantities of 25 kg or less of an approved animal foodstuff, it shall be sufficient if the approved animal foodstuff sold is taken out in the presence of and with the knowledge of the purchaser from a parcel bearing a label on which are marked the particulars required under this rule.

9. Any person who sells approved fertilizers without complying with the requirements of rules 2, 3 and 4 of these Rules, and any person who sells approved fertilizers partly or wholly by virtue of the contents of its constituents without complying with the requirements of rule 5 of these Rules and any person who sells approved animal foodstuffs without complying with the requirements of rule 8 of these Rules, shall be guilty of an offence and liable to a fine not exceeding three thousand shillings or to imprisonment for a term not exceeding three months or to both such fine and such imprisonment.

THE FERTILIZERS AND ANIMAL FOODSTUFFS (PACKING OF APPROVED ANIMAL FOODSTUFFS) RULES

[Legal Notice 212 of 1972]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Packing of Approved Animal Foodstuffs) Rules.

2. Approved animal foodstuffs exposed for sale in quantities of 25 kg or more shall be packed in containers which are of sufficient strength and sufficiently sealed so as to withstand reasonable handling without tearing, bursting or falling open.

3. Each container containing approved animal foodstuffs, shall be clean and free from visible indications of contamination, infection and insect infestation.

4. Each container containing 25 kg or more of an approved animal foodstuff shall be clearly, conspicuously and indelibly marked with or the particulars shown hereunder shall bear a securely attached label showing the following particulars—

(a) the name and full postal and business address of the manufacturer or seller;

(b) the name and weight in kilogrammes of the animal foodstuff contained therein;

(c) the guaranteed analysis expressed as a percentage to the first decimal place of each of the constituents for which guarantees are required under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972 (L.N. 216/1972);

(d) the date of manufacture or other code or reference figures or letter by which the animal foodstuff may be identified as required under the Fertilizers and Animal Foodstuffs (Records and Returns) Rules, 1972 (L.N. 217/1972).

5. In the case of sale of approved animal foodstuffs in quantities of less than 25 kg, it shall be adequate, if the animal foodstuff sold is taken out in the presence of and with the knowledge of the purchaser from a container in which the vendor himself bought the animal foodstuff and on which are clearly, conspicuously and indelibly marked the particulars required under rule 4 of these Rules.

6. Any person who sells approved animal foodstuffs in containers in quantity of 25 kg or more which do not comply with the requirements of rules 2, 3 and 4 of these Rules, shall be guilty of an offence and liable to a fine not exceeding three thousand shillings or to imprisonment for a term not exceeding three months or to both such fine and such imprisonment.

THE FERTILIZERS AND ANIMAL FOODSTUFFS (PACKING OF APPROVED FERTILIZERS) RULES

[Legal Notice 210 of 1972]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Packing of Approved Fertilizers) Rules.

2. Approved fertilizers exposed for sale in quantities of 25 kg or more shall be packed in weather-proof containers or packages which are of sufficient strength and sufficiently sealed and which are made of a sufficiently strong material which will withstand reasonable handling without tearing, bursting or falling open.

3. Each container or package as the case may be containing 25 kg of approved fertilizers shall be branded or indelibly marked or shall bear a securely fixed label showing the following particulars—

(a) the name of the fertilizer as specified in the first column of the Schedule to the Fertilizers and Animal Foodstuffs (Approved Fertilizers) Rules (L.N. 209/1972);

(b) the weight in kilogrammes of the Fertilizer which the container or package contains;

(c) in the case of fertilizer which is superphosphate or supers the minimum percentage of water soluble phosphorus pentoxide which the vendor guarantees the fertilizer to contain in the declaration and warranty under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules (L.N. 216/1972);

(d) in the case of fertilizer which is Soda phosphate, the minimum percentage of phosphorus pentoxide which is soluble in 2 per cent citric acid which the vendor guarantees the fertilizer to contain in the declaration and warranty under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972;

(e) in the case of which fertilizer is Basic Slag, the minimum percentage of phosphorus pentoxide which is soluble in 2 per cent citric acid which the vendor guarantees the fertilizers to contain in the declaration and warranty under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972, and the minimum percentage of fertilizer which the vendor guarantees, will pass through a Standard Test Sieve Mesh No. 100 (minimum specification B.S. 410) having apertures not greater than 0.152 mm square in the declaration and warranty under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972;

(f) in the case of fertilizer which is Rock phosphate, Seychelles Guano or bonemeal the minimum percentage of phosphorus pentoxide which is soluble in mineral acid which the vendor guarantees the fertilizer to contain in the declaration and warranty under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972;

(g) in the case of fertilizer which is a compound fertilizer, the minimum percentage of nitrogen and of water soluble phosphorus pentoxide or of phosphorus pentoxide which is soluble in 2 per cent citric acid or mineral acid which the vendor guarantees the fertilizer to contain and the forms in which nitrogen is present in the declaration and warranty under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972;

(h) in the case of fertilizer which is urea or urea containing compound fertilizer, the minimum percentage of nitrogen and the maximum percentage of biuret which the vendor guarantees the fertilizer to contain in the declaration and warranty under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972;

(i) in the case of fertilizer which is Ammonium Sulphate Nitrate, that it contains at least 2 per cent nitrogen;

(j) in the case of fertilizer which is Sulphate of Ammonia, that it contains at least 20 per cent nitrogen and the maximum amount of free acid (if this is in excess of 0.03 per cent) which the vendor guarantees the fertilizer to contain under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972;

(k) in the case of fertilizer which is Calcium Ammonium Nitrate, that it contains at least 20 per cent nitrogen;

(l) in the case of fertilizer which is Nitrate of soda, that it contains at least 15 per cent nitrogen;

(m) in the case of fertilizer which is Diammonium Phosphate, the minimum percentage of nitrogen and the minimum percentage of water soluble phosphorus pentoxide which the vendor guarantees the fertilizer to contain in the declaration and warranty under the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972.

4. In the case of the sale of approved fertilizers in quantities less than 25 kg it shall be adequate, if the fertilizer sold is taken out in the presence of and with the knowledge of the purchaser from a container which is branded or indelibly marked or has a securely fixed label showing the particulars required under rule 3 of these Rules and transferred to an empty container or package meant to hold quantities of 25 kg or more of the sale fertilizer.

5. Any person who sells approved fertilizers in containers or packages in quantities of 25 kg or more which do not comply with the requirements of rules 2 and 3 of these Rules shall be guilty of an offence and liable to a fine not exceeding three thousand shillings or to imprisonment for a term not exceeding three months or to both such fine and such imprisonment.

THE FERTILIZERS AND ANIMAL FOODSTUFFS (RECORDS AND RETURNS) RULES

[Legal Notice 217 of 1972]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Records and Returns) Rules.

2. Every importer, manufacturer and vendor of fertilizer or animal foodstuffs shall keep records in English in respect of every transaction he makes in fertilizers or animal foodstuffs.

3. (1) These records shall show for each sale of fertilizers and animal foodstuff—

(a) his own name and full postal address;

(b) the date on which the sale was made;

(c) the name whereby each of the fertilizer and animal foodstuff sold is described in declaring it to an approved animal foodstuff for the purpose of the Act and the amount in tonnes and kilogrammes which was sold;

(d) sufficient detail of the marks on each container or package in which the fertilizer or animal foodstuff was sold, or from which it was taken in making the sale or on the label attached thereto for the said container or package to be identifiable, and on completion of each sale the vendor shall furnish the purchaser with a copy of the record of the sale.

(2) These records shall further show—

(a) For each sale of 500 kilogrammes or more of a fertilizer and for each and every sale of fertilizer for resale purposes—

(i) the name and full postal address of the person or concern to whom he sold the fertilizer;

(ii) a true copy of the declaration and warrant which he gave the purchaser in accordance with the provisions of rules 2, 3 and 4 of the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972 (L.N. 216/1972).

(b) For each purchase of fertilizers—

(i) the name and full postal address of the person or concern selling the fertilizer;

(ii) the original of the declaration and warrant which was given to the purchaser in accordance with the provisions of rules 2, 3 and 4 of the Fertilizer and Foodstuffs (Declaration and Warranty) Rules, 1972.

(c) For each transaction in an animal foodstuff in respect of which a declaration and warrant was issued in accordance with the provisions of rule 8 of the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972, the original or a true copy of the said declaration and warrant.

4. The vendor should keep the records prescribed in rule 3 of these Rules in respect of the transactions in any fertilizer and animal foodstuff for at least two years after the date of the transaction in the case of fertilizer and at least one year after the date of the transaction in the case of an animal foodstuff.

5. Any person who fails to keep and maintain the records prescribed in rules 2 and 3 for the period prescribed in rule 4 of these Rules shall be guilty of an offence and liable for a first offence, to a fine not exceeding two thousand shillings or to imprisonment for a term not exceeding two months or to both such fine and such imprisonment and for a second and subsequent offence to a fine not exceeding three thousand shillings or to imprisonment for a term not exceeding three months or to both such fine and imprisonment.

THE FERTILIZERS AND ANIMAL FOODSTUFFS (SAMPLING) RULES

[Legal Notice 214 of 1972]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Sampling) Rules.

2. Where a sample is drawn under section 9(1)(c) or section 10 of this Act, it shall be drawn in the manner prescribed under these Rules.

3. The sample shall be taken in as equal portions as possible each of not less than 280 gm weight from evenly distributed parts of the whole. It shall be drawn only from sound containers or packages whose seals are intact, which are marked in accordance with the requirements of rule 3 of the Fertilizers and Animal Foodstuffs (Packing of Approved Fertilizers) Rules, 1972 (L.N. 210/1972), or rule 4 of the Fertilizers and Animal Foodstuffs (Packing of Approved Animal Foodstuffs) Rules, 1972 (L.N. 212/1972), or from open containers or packages from which fertilizers or animal foodstuffs are being sold in quantities of less than 25 kg, in accordance with rule 4 of the Fertilizers and Animal Foodstuffs (Packing of Approved Fertilizers) Rules, 1972, or rules 5 and 8 of the Fertilizers and Animal Foodstuffs (Declaration and Warranty) Rules, 1972 (L.N. 216/1972).

4. Where the fertilizer or animal foodstuff being sampled is in a single container or package and weighs 25 kilos or less, the entire package shall be taken as the sample.

5. Where a single container or package contains more than 25 kilos or where the number of containers or packages is more than one but not more than ten, portions of the sample shall be drawn from each container or package and a minimum of five portions shall be taken.

6. Where the number of containers or packages is more than ten but not more than forty, portions of the sample shall be drawn at the rate of at least one portion per two containers or packages and a minimum of ten portions shall be taken.

7. Where the number of containers or packages is in excess of forty, it shall be adequate to collect twenty well distributed portions.

8. The number of portions taken shall be the number appropriate to the number of containers or packages of the fertilizer or animal foodstuff being sampled which is present at the time of sampling.

9. Appropriate tools if available may be used to assist in the drawing of the samples except that where valid objection is raised to the use of any particular tool on account of its unsuitability for sampling the material concerned, that tool shall not be used in the taking of the sample.

10. When the material to be sampled is in cakes, single cakes may be taken as individual portions of the sample.

11. Where the material is in large lumps single lumps may be taken as individual portions of the sample.

12. Where the product to be sampled is in a fluid or semifluid condition, it shall first be well mixed by stirring or shaking.

13. Where a spile is used for sampling it shall have a blade which shall be long enough to penetrate the full length of the container or package and shall be of at least 1.90 cm internal diameter. It shall be inserted closed or mouth downwards and driven fully into the container or package being sampled. It shall then be opened or turned mouth upwards and so manipulated as to become filled with the material being sampled. It shall be then withdrawn smoothly for emptying.

14. The portions of a solid sample when drawn shall be spread in a place where they are adequately protected against contamination. They shall then be broken up and any matted material present shall be pulled apart and chopped up in such a manner that the whole will pass through a sieve with meshes 3.20 cm across. The sieved material shall then be

thoroughly mixed and shall be taken as the main sample. The main sample shall be reduced by sub-sampling, if necessary for preparing the Official Sample.

15. In sub-sampling, the material to be sub-sampled shall be thoroughly worked up and mixed and shall then be spread evenly on a smooth clean surface. It shall then be divided into four approximately equal quarters by two straight lines intersecting one another approximately at right angles near the middle of the sample. The quarters shall then be separated one from the other and two diagonally opposing quarters shall be rejected and the other two retained. The operation shall be repeated as necessary for reducing the sample to the size required.

16. The sample obtained as the result of the operation prescribed under rules 14 and 15 of these Rules shall again be mixed and shall be spread evenly and shall be divided into three similar parts and these shall be known as the Official Samples. Each of the three Official Samples shall be placed in a clean dry bottle, jar or other container with a close fitting lid, stopper, cover or seal and this in the case of a fertilizer or animal foodstuff which is likely to undergo change on exposure shall be air tight. The weight of each Official Sample shall be between 0.5 and 1 kg.

17. Where the main sample readily separates into a number of distinct fractions that do not readily mix together, the fraction shall be sub-sampled separately and the Official Samples shall be prepared by adding the sub-samples of each fraction to the sub-samples of the other fractions in amount which is proportional to its amount in the main sample.

18. Liquid main samples shall be mixed thoroughly by stirring in a clean open container and after mixing the three Official Samples each shall be drawn directly from several well spaced points.

19. Where the fertilizer or animal foodstuff being sampled contains material which changes rapidly on exposure to air, sampling, sub-sampling and the preparation and packing of the Official Sample shall be undertaken in a dry place and as quickly as possible.

20. The container in which an Official Sample has been packed shall be so secured or placed in a sealed package that its contents cannot be reached without breaking the seal, the container or the package.

21.(1) The Inspector drawing an Official Sample shall affix to each container or package containing such Official Sample a certificate signed by himself and stating—

(a) his own name and full postal address and the authority under which he acts;

(b) that the sample therein was collected according to the procedure prescribed in these Rules;

(c) the particulars marked on the containers or packages from which the sample was drawn or on the labels attached to those packages in accordance with the requirements of rule 3 of the Fertilizers and Animal Foodstuffs (Packing of Approved Fertilizers) Rules, 1972 (L.N. 210/1972), or rule 4 of the Fertilizers and Animal Foodstuffs (Packing of Approved Animal Foodstuffs) Rules, 1972 (L.N. 212/1972);

(d) the date and place where the sample was taken;

(e) the name and full postal and business addresses of the manufacturer where known and the seller or the person in possession of the fertilizer or animal foodstuff at the time the sample was taken;

(f) the name and full postal and business addresses of the person if any under whose instructions the sample was taken;

(g) his observations on the conditions under which the fertilizer or animal foodstuff was being stored at the time of taking the sample.

(2) He shall then despatch one Official Sample, with the Certificate attached, to an analyst appointed under section 8 of this Act and one under registered cover to the

person holding the fertilizer or animal foodstuffs for sale or who last sold the fertilizer or animal foodstuff and shall forward the third sample to the Government chemist.

22. Where the fertilizer or animal foodstuff clearly is adulterated with stones, pieces of iron or other objects, no sample shall be taken but the Inspector shall seize and hold in safe custody such quantity of the material as he thinks fit.

THE FERTILIZERS AND ANIMAL FOODSTUFFS (STERILIZATION OF BONES) RULES

[Legal Notice 213 of 1972, Legal Notice 122 of 2007]

1. These Rules may be cited as the Fertilizers and Animal Foodstuffs (Sterilization of Bones) Rules.

2. (1) For the purposes of sections 4 and 5 of the Act any bone, bones or other substances of animal origin imported into Kenya or used for the purpose of manufacturing any fertilizer or animal foodstuff shall have been sterilized by—

(a) subjection to a dry heat of 140°C for not less than three hours; or

(b) subjection to a moist heat under steam pressure of not less than 1.4 kilogrammes per sq. centimetre; 1.3 atmospheres for fifteen minutes; or

(c) treatment of the bones after they are broken with the vapour of benzene (benzol) boiling between 95°C and 115°C for not less than four hours; live steam to be thereafter admitted for one hour,

and shall be free of *Bacillus anthracis* and organisms of the gas grangrene type.

(2) After sterilization every precaution shall be taken to prevent reinfection of the sterilization product and it shall be packed at the factory in new bags.

(3) No vehicle, vessel or barge which has been used for the conveyance of unsterilized bones or other substances derived from animal carcasses shall be used for the transport of sterilized animal products unless it has been first disinfected with a disinfectant solution equal in disinfective value to a 5 per cent solution of standard phenol.

3. Every application for a licence to use a sterilizing plant shall be submitted in triplicate in the form in the Schedule to these Rules.

SCHEDULE

[r. 3]

APPLICATION FOR LICENSING OF A STERILIZING PLANT

[L.N. 122/2007, r. 2.]

(From ..... To .....)

PART I

1. Name of Applicant .....

2. Address and locally where plant is situated .....

3. What substances derived from animal carcasses are being sterilized .....

.....

4. Name and Trade Mark (*if any*) of Plant .....

.....

5. Whether Dry Steam Sterilization Process is applied .....

.....

6. Number of Wet Steam Digestors and Dry Steam Digestors comprising the plant .....

7. Capacity of each Digestor separately .....

8. Maximum Steam Pressure per sq. cm each Digestor can be subjected to: .....

9. Whether sterilized substance is to be dried in open air or by special installation .....

.....

10. If a Special Drying Installation is used, state whether a Rotating Pot is used, and whether heat is applied by steam or open fire .....

....
Date *Signature of Applicant*

PART II

CROSSING *(For Official Use Only)*

No. .....

I certifiy that the Sterilizing Plant referred to in Part I has been licensed. The licence expires on .....

....
Date *Licensing Officer*

THE FERTILIZERS AND ANIMAL FOODSTUFFS (IMPORTATION AND USE OF MEAT AND BONE MEAL) (PROHIBITION) REGULATIONS

[Legal Notice 19 of 2001]

1. These Regulations may be cited as the Fertilizers and Animal Foodstuffs (Importation and Use of Meat and Bone Meal) (Prohibition) Regulations.

2. In these Regulations, unless the context otherwise requires—

"animal foodstuffs", includes bone, bone meal, meat meal or any other substance derived from an animal carcass for purposes of feeding or manufacturing any animal foodstuffs;

"ruminant" includes both domestic and wild animals which chew their cud.

3. No person shall import, cause or suffer from any meat meal or bone meal or the products thereof to be imported into Kenya.

4. No person shall use any ruminant meat meal or bone meal or products derived therefrom in the manufacture of animal foodstuffs or mineral supplements for feeding ruminants.

5. Any person who fails to comply with these Regulations shall be guilty of an offence.