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 STATUTORY INSTRUMENTS
 

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1988 No. 2190 (S.212)

**FOOD**

**MILK AND DAIRIES**

**The Milk and Dairies (Semi-skimmed and Skimmed Milk) (Heat Treatment) (Scotland) Regulations 1988**

<i>Made</i> - - - -	<i>14th December 1988</i>
<i>Laid before Parliament</i>	<i>19th December 1988</i>
<i>Coming into force</i>	<i>1st January 1989</i>

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The Secretary of State, in exercise of the powers conferred on him by sections 4, 26(3) and 56 of the Food and Drugs (Scotland) Act 1956(a) and of all other powers enabling him in that behalf, and after consultation with such organisations as appear to him to be representative of interests substantially affected by these Regulations, hereby makes the following Regulations:

#### Citation and commencement

1. These Regulations may be cited as the Milk and Dairies (Semi-skimmed and Skimmed Milk) (Heat Treatment) (Scotland) Regulations 1988, and shall come into force on 1st January 1989.

#### Interpretation

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

“the Act” means the Food and Drugs (Scotland) Act 1956;

“approved bactericidal agent” means a chemical agent approved by the Secretary of State;

“bulk container” means any container, other than a retail container;

“bulk milk” means milk which is not packed or made up in advance in the bottle or other container in which it is to be supplied to the consumer;

“consumer” means any person to whom milk is supplied and who neither sells it nor uses it in the manufacture of milk products for sale;

“local authority” means an islands or district council;

“milk” means cows’ milk intended for sale or sold for human consumption, but does not include such milk intended for manufacture into products for sale for human consumption;

“milk processor” means any person who pasteurises, sterilises or treats milk by the ultra high temperature method;

“milk purveyor” includes any person who sells milk, whether wholesale or by retail;

“raw milk” means milk which has not been treated by heat;

“retail container” means a bottle or other container which has a capacity of not more than 5 litres;

“sell” includes offer or agree to sell or expose for sale; and “sold” shall be construed accordingly;

“semi-skimmed milk” means milk the fat content of which has been brought to at least 1.50 per cent and at the most 1.80 per cent calculated by weight;

(a) 1956 c.30; section 4 was amended by the European Communities Act 1972 (c.68), Schedule 4, paragraph 3(1); section 26(3) was amended by the Local Government (Scotland) Act 1973 (c.65), Schedule 27, Part II, paragraph 123(a), and by the Local Government and Planning (Scotland) Act 1982 (c.43), Schedule 4, Part I; section 56 was amended by the Weights and Measures Act 1963 (c.31), Schedule 9, Parts I and II, by the Criminal Justice Act 1982 (c.48), Schedule 15, paragraph 8, and by the Law Reform (Miscellaneous Provisions) (Scotland) Act 1985 (c.73), section 41, and should be read with section 289GA(2) of the Criminal Procedure (Scotland) Act 1975 (c.21) (inserted by section 66 of the Criminal Justice (Scotland) Act 1987 (c.41)).

"skimmed milk" means milk the fat content of which has been brought to not more than 0.30 per cent calculated by weight.

(2) Any reference in these Regulations to a numbered regulation or Schedule shall, unless the context otherwise requires, be construed as a reference to the regulation or Schedule so numbered in these Regulations.

#### **Heat treatment of semi-skimmed and skimmed milk**

3.—(1) Subject to paragraphs (3) and (4) of this regulation, no person shall sell any semi-skimmed milk or skimmed milk unless the requirements specified in paragraph (2) of this regulation are satisfied.

(2) The requirements to be satisfied are—

- (a) the general requirements of Schedule 1 in connection with the heat treatment of semi-skimmed milk and skimmed milk;
- (b) such of the special requirements as are applicable of Part I, II or III of Schedule 2 in relation to and in connection with such heat treatment by pasteurisation, sterilisation or the ultra high temperature method respectively;
- (c) the requirements of Schedule 3 as to sampling;
- (d) such of the requirements as are applicable of Part I, II, III or IV of Schedule 4 as to the testing of samples.

(3) Where semi-skimmed milk or skimmed milk is brought into Scotland from England, Wales or Northern Ireland, the requirements of Schedule 1 and any Part of Schedule 2 in relation to that milk shall, so far as they would relate to anything to be done before that milk enters Scotland, be deemed to be satisfied if the corresponding requirements of legislation having effect for the time being in England and Wales or Northern Ireland (as the case may be) in relation to the heat treatment of that milk are satisfied.

(4) Paragraph (2)(b), (c) and (d) of this regulation shall not apply to the sale of semi-skimmed milk or skimmed milk to a milk processor for heat treatment in accordance with these Regulations.

#### **Enforcement**

4.—(1) The local authority of any area shall enforce and execute the provisions of these Regulations within their area.

(2) Every local authority shall give such assistance and information to any other local authority as that other local authority may reasonably require for the purpose of carrying out their duties under these Regulations.

#### **Penalties**

5. If any person contravenes or fails to comply with any of the provisions of regulation 3, he shall be guilty of an offence and shall be liable—

- (a) on summary conviction to a fine not exceeding the statutory maximum;
- (b) on conviction on indictment to a fine or to imprisonment for a term not exceeding one year or both.

#### **Application of various sections of the Act**

6.—(1) Without prejudice to the provisions of the Act which specifically apply in respect of regulations made thereunder, sections 41(2) (which relates to proceedings) and 42(1), (2) and (3) (which relates to evidence of sampling and certificates of analysis) of the Act shall apply for the purposes of these Regulations as if references therein to proceedings under or taken under the Act included references to proceedings for an offence under these Regulations.

(2) Section 31(6) of the Act shall apply for the purposes of these Regulations as if the reference therein to an offence against the Act included reference to an offence under these Regulations.

(3) Section 42(2) of the Act shall apply for the purposes of these Regulations as if the reference therein to a document stating that the provisions of the Act with respect to the

manner in which samples are to be dealt with were complied with included a reference to a document stating that such provisions of these Regulations were complied with.

**Importation of Milk (Scotland) Regulations 1988**

7. These Regulations apply to imported milk, except in so far as specifically provided in paragraph 4 of Schedule 3 to the Importation of Milk (Scotland) Regulations 1988(a).

**Revocations**

8. The Regulations specified in Schedule 5 are hereby revoked.

St. Andrew's House, Edinburgh  
14th December 1988

*Sanderson of Bowden*  
Minister of State,  
Scottish Office

## Regulation 3(2)

## SCHEDULE 1

## GENERAL REQUIREMENTS IN CONNECTION WITH THE HEAT TREATMENT OF SEMI-SKIMMED MILK AND SKIMMED MILK

1. Every milk processor shall take such measures as are adequate to ensure that any semi-skimmed milk or skimmed milk which has been heat treated by pasteurisation, sterilisation or the ultra high temperature method shall be kept apart from all other milk at all times except when in separate sealed containers.
2. Every milk processor and every milk purveyor shall keep accurate records of
  - (a) the quantities of milk purchased and sold by him, as the case may be, and of the names and addresses of the persons from whom that milk was purchased and to whom it was sold otherwise than by retail;
  - (b) the quantities of milk delivered, other than by way of purchase or sale, to or from the premises where the semi-skimmed milk or skimmed milk was produced, and of the names and addresses of the persons, other than consumers, from or to whom such deliveries were made;and shall retain such records for a period of twelve months from the date of any transaction to which the records relate.
3. Without prejudice to any provisions as to inspection contained in any enactment relating to milk and dairies or any order or regulations or byelaws made thereunder, any person duly authorised by the local authority may—
  - (a) inspect the processes of handling and treatment and the arrangements for the storage and distribution of semi-skimmed milk and skimmed milk; and
  - (b) inspect any records which the milk processor or the milk purveyor, as the case may be, is required to keep by these Regulations.
4. Any container into which the semi-skimmed milk or skimmed milk is put shall be sterilised by steam or by a solution containing an approved bactericidal agent on the premises in which the milk is put into the container on each occasion before the container is used for the milk:

Provided that this paragraph shall not apply to non-returnable containers which the local authority are satisfied are sterile, or to bottles cleansed in bottle washing machines on the premises in which they are to be filled with milk.
5. Such parts of any plant or apparatus as come into contact with the semi-skimmed milk or skimmed milk shall be sterilised either by steam or by water at a temperature of not less than 82.2°C. or by a solution containing an approved bactericidal agent on each occasion before the plant or apparatus is used for the milk.
6. Milk which has been heat treated in another Member State of the European Economic Community shall not be accepted for further heat treatment unless it is accompanied by a certificate prescribed by the Importation of Milk (Scotland) Regulations 1988.
7. Milk which is transferred from one container to another prior to heat treatment shall be so treated as soon as practicable after the first container has been opened.
8. Raw milk shall not be accepted for heat treatment unless—
  - (a) over the preceding two months not less than two samples of the producer's raw milk have been taken each month, the samples have been submitted to a plate count test the results of which have been recorded and the geometric average of those results is not more than 100,000 per ml.; or
  - (b) the milk processor has purchased the milk as bulk milk which complies with the requirements of sub-paragraph (a) above and with a written warranty to that effect.
9. Raw milk which is not heat treated within 36 hours of its admission to the heat treatment establishment shall not be subjected to heat treatment unless—
  - (a) the milk processor has, in the handling and storage of the milk, taken steps to ensure that a sample of that milk taken and submitted to a plate count test achieves a result of not more than 200,000 per ml.; and
  - (b) a sample is taken of that milk, the sample is submitted to a plate count test and the result is recorded.
10. In any proceedings for a breach of paragraph 8 or 9 above, evidence of a sample taken in accordance with Schedule 3 or of a plate count test carried out as prescribed in Part I of Schedule 4

shall be preferred to evidence of a sample taken or of a plate count test carried out, respectively, by any other method.

11. The milk processor shall retain for a period of not less than three months—
  - (a) from the date of further heat treatment any certificate referred to in paragraph 6 above;
  - (b) any warranty referred to in paragraph 8(b) above;
  - (c) any records made in compliance with paragraphs 8(a) and 9(b) above.

## SCHEDULE 2

Regulation 3(2)

### SPECIAL REQUIREMENTS IN RELATION TO AND IN CONNECTION WITH THE HEAT TREATMENT OF SEMI-SKIMMED MILK AND SKIMMED MILK

#### PART I – PASTEURISATION

*A. Conditions applicable when pasteurised milk is produced from raw milk or from bulk milk which has been heat treated for transport*

1. The milk shall be pasteurised, that is to say—
  - (a) it shall be heated to and maintained for a period of at least 30 minutes at a temperature of not less than 62.8°C. and not more than 65.6°C. and immediately after the termination of the said period shall be cooled to a temperature of not more than 6°C.; or
  - (b) it shall be heated to and maintained for a period of at least 15 seconds at a temperature of not less than 71.7°C. and not more than 78.3°C. and immediately after the termination of the said period shall be cooled to a temperature of not more than 6°C.; or
  - (c) it shall be heated to and maintained at such temperature for such period as may be specified by the local authority with the approval of the Secretary of State, and subsequently cooled to a temperature of not more than 6°C.;

and the apparatus in which the milk is pasteurised shall be approved by the local authority and shall provide for the milk being pasteurised to be filtered.

2.—(1) The temperature to which milk is treated in accordance with paragraph 1 of this Part of this Schedule shall be automatically controlled.

(2) Where the milk is treated by a continuous flow method and is pasteurised in accordance with—
 

- (a) the provisions of sub-paragraph (b) of paragraph 1 of this Part of this Schedule; or
- (b) a method approved by the Secretary of State under sub-paragraph (c) of the said paragraph;

 the apparatus shall be provided with a device which is capable of automatically diverting the flow of any milk which is not retained at a temperature of at least 71.7°C., or at any other temperature which may be specified in terms of paragraph 1(c) above, and with a device which will automatically record when the flow of milk is being diverted and when the automatic flow diversion device is not in operation. Each record shall be marked with the date on which it was made and shall be preserved for a period of not less than three months.

(3) Indicating and recording thermometers shall be installed in suitable places in the apparatus so as respectively to indicate and record the period of time for, and the temperature to, which the milk is heated when pasteurised in accordance with sub-paragraph (a), or any batch process approved under sub-paragraph (c), of paragraph 1 of this Part of this Schedule, or the temperature to which milk is heated when pasteurised in accordance with sub-paragraph (b), or any continuous flow process approved under sub-paragraph (c), of the said paragraph 1.

(4) The temperature to which the milk is cooled shall be indicated by a thermometer installed in the apparatus and shall be recorded by a recording thermometer.

3. Indicating and recording thermometers shall be marked in graduations not greater than 1°C., adequately spaced to give clear readings, and each record shall be marked with the date on which it was made and shall be preserved for a period of not less than three months.

4. Immediately after the milk is cooled the milk processor shall, on the premises where it was pasteurised, either put it into retail containers or into unventilated bulk containers.

5. Every retail container shall, immediately after the milk has been put into it, be securely closed and, where such a container is a bottle, it shall be closed with a cap overlapping the lip of the bottle.

6. Where the milk has been put into retail containers, it shall not be removed from these containers or the caps or fastenings broken before delivery to the consumer.

7.—(1) A sample of the milk taken in accordance with Schedule 3 at the heat treatment establishment after pasteurisation shall satisfy the plate count test and the coliform test prescribed in Parts I and II of Schedule 4. The sample shall be deemed to satisfy the coliform test if the coliform count is less than 1 per ml. The sample shall be deemed to satisfy the plate count test if the plate count is not greater than 30,000 per ml.

(2) A sample of the milk taken in accordance with Schedule 3 at the heat treatment establishment after pasteurisation shall after incubation for 5 days at 6°C. satisfy the plate count test prescribed in Part I of Schedule 4. The sample shall be deemed to satisfy the test if the plate count is not greater than 100,000 per ml.

(3) A sample of milk taken in accordance with Schedule 3 after pasteurisation and before delivery to the consumer shall satisfy the phosphatase test prescribed in Part III of Schedule 4. The phosphatase test shall be deemed to be satisfied if the milk gives a reading of 10 µg or less of p-nitrophenol/ml. of milk.

(4) A sample of milk taken in accordance with Schedule 3 after it leaves the heat treatment establishment and before delivery to the consumer shall satisfy the coliform test prescribed in Part II of Schedule 4. The sample shall be deemed to satisfy the coliform test if the coliform count is less than 100 per ml.

*B. Additional conditions applicable when pasteurised milk is produced from bulk milk which has been heat treated for transport*

8.—(1) Where any bulk milk which has, for the purposes of transportation, been heat treated in another heat treatment establishment is to be subjected to pasteurisation in accordance with these Regulations, the requirements specified in the following sub-paragraphs shall apply.

(2) Milk shall not be accepted for pasteurisation unless it has a temperature not exceeding 6°C. on admission to the heat treatment establishment and is retained at such a temperature until pasteurisation.

(3) The milk processor shall check and record the temperature of the milk on admission to the heat treatment establishment and immediately before pasteurisation.

(4) For purposes of identifying sources of supply which exceed a plate count of 100,000 per ml., in order to exclude such milk from pasteurisation in accordance with these Regulations, the milk processor shall—

- (a) before pasteurisation take a sample of the milk in accordance with Schedule 3;
- (b) submit it to the plate count test prescribed in Part I of Schedule 4; and
- (c) record the result.

(5) The milk processor shall retain for a period of not less than three months the records made in compliance with sub-paragraphs (3) and (4) above.

## PART II – STERILISATION

1. The milk, having been filtered or clarified, and (except in the case of skimmed milk) homogenised, shall be sterilised in the following manner, that is to say, it shall be heated to and maintained at such a temperature, not less than 100°C., for such a period as to ensure that it will comply with the turbidity test prescribed in Part IV of Schedule 4.

2. The milk shall be treated by heat as aforesaid in capped bottles so that on completion of the treatment the bottles are hermetically sealed.

3. The apparatus in which the milk is sterilised shall be approved by the local authority.

4.—(1) Thermometers and pressure gauges shall be inserted in suitable places in the apparatus so as to indicate the temperature to which the milk is raised.

(2) The records of recording thermometers shall be marked with graduations adequately spaced to give clear readings, and they shall be dated and shall be preserved for a period of not less than 3 months.

5. The bottles shall remain sealed until delivery to the consumer.

6.—(1) A sample of the milk taken in accordance with Schedule 3 at the heat treatment establishment after sterilisation shall satisfy the plate count test prescribed in Part I of Schedule 4. The sample shall be deemed to satisfy the plate count test if the plate count is not greater than 100 per ml.

(2) A sample of the milk taken in accordance with Schedule 3 after sterilisation and before delivery to the consumer shall satisfy the turbidity test prescribed in Part IV of Schedule 4. The sample shall be deemed to satisfy the test if it gives a filtrate showing no sign of turbidity.

### PART III – TREATMENT BY ULTRA HIGH TEMPERATURE METHOD

1. The milk shall be treated by the ultra high temperature method, that is to say retained at a temperature of not less than 135°C. for not less than one second.

2. The apparatus in which the milk is treated by the ultra high temperature method shall be approved by the local authority and shall provide for the milk undergoing such treatment to be filtered.

3. Any apparatus in which the milk is to be heated to and maintained at a temperature of not less than 135°C. shall be provided with a device which will automatically divert the flow of any milk which is not raised to the authorised temperature.

4.—(1) Such indicating and recording thermometers as the local authority shall consider necessary shall be installed in suitable places in the apparatus in which the milk is treated by the ultra high temperature method so as to indicate the temperatures to which the milk is heated.

(2) The records of recording thermometers shall be marked with graduations adequately spaced to give clear readings, and they shall be dated and shall be preserved for a period of not less than 3 months.

5.—(1) Milk which is treated by the ultra high temperature method shall immediately after such treatment be put into the sterile containers in which it is to be supplied to the consumer. Such containers shall be filled and sealed at the premises at which the treatment has been carried out with such aseptic precautions as will ensure the protection of the milk from risk of contamination and shall remain sealed until delivery to the consumer.

(2) Every container in which milk treated by the ultra high temperature method is transported, exposed or offered for sale shall be so closed and securely fastened, either with a cap overlapping the lip of the container or in some other suitable manner approved by the local authority, that the container is airtight.

6.—(1) A sample of the milk taken in accordance with Schedule 3 at the heat treatment establishment after treatment by the ultra high temperature method shall satisfy the plate count test prescribed in Part I of Schedule 4. The sample shall be deemed to satisfy the plate count test if the plate count is not greater than 100 per ml.

(2) A sample of milk taken in accordance with Schedule 3 after treatment by the ultra high temperature method and after it leaves the heat treatment establishment but before delivery to the consumer shall satisfy the plate count test prescribed in Part I of Schedule 4. The sample shall be deemed to satisfy the plate count test if the plate count is not greater than 1,000 per ml.



## Regulation 3(2)

## SCHEDULE 3

**PROVISIONS AS TO THE PROCURING, IDENTIFICATION AND  
TRANSPORTATION OF SAMPLES OF SEMI-SKIMMED MILK AND  
SKIMMED MILK**

1. Sampling shall be carried out in the following manner:-
  - (a) where the milk is in retail containers, by procuring one of the containers;
  - (b) where the milk is in bulk containers, by taking the sample from well below the surface of the milk after the milk has been thoroughly stirred, the instruments used for stirring and sampling the milk having been sterilised before use;
  - (c) where milk from each bulk container of a consignment is sampled, the volume of the sample taken from each such container shall be proportionate to the volume of milk in that container and the samples so taken shall then be mixed so as to constitute a sample of the consignment; and
  - (d) where milk is in dispensing apparatus, the sample may be procured from the outlet.
  
2. The person procuring the sample shall, immediately the sample has been procured, divide it into two parts each of which shall be put into a bottle which shall immediately be stoppered, the bottle and its stopper being sterilised before use, and which shall be sealed and marked or labelled with a distinctive mark, and he shall-
  - (a) forward one part to the person who caused the milk to be placed in the container from which the sample was taken together with a notice informing him that he intends to have part of the sample tested in accordance with the provisions of Schedule 4; and
  - (b) forward one part to the testing laboratory in accordance with the provisions of paragraph 3 of this Schedule.
  
- 3.—(1) Immediately after it has been marked or labelled, the vessel containing the sample which is to be tested shall be transferred to a box or case having a tightly fitting lid and lined throughout with insulating material, which box or case shall be despatched to the testing laboratory as soon as practicable.
  - (2) Where there is delay in despatch to the laboratory, such additional measures as are practicable, including the use of an adequate quantity of suitable refrigerant within the box or case, shall be taken to prevent the temperature of the sample from rising.
  - (3) Any sample of raw milk, bulk milk heat treated for transport or pasteurised milk which is to be subjected to the plate count test or coliform test prescribed in Parts I and II of Schedule 4 shall, during its transportation to the testing laboratory, be retained at a temperature of not less than 0°C. and not more than 5°C.
  - (4) With the vessel containing the sample there shall be sent to the testing laboratory a note bearing the distinctive mark with which the vessel is marked or labelled, and the time at and date on which the sample was procured.

## Regulation 3(2)

## SCHEDULE 4

**TESTING OF SAMPLES**

**Part I**

**THE PLATE COUNT TEST FOR SEMI-SKIMMED AND SKIMMED MILK**

**General**

1. In testing samples of milk for bacterial count the following paragraphs of this Part of this Schedule shall be complied with.

**Treatment of sample before testing**

2. On arrival at the testing laboratory samples of milk shall be treated according to the following provisions.
  - (a) *Any samples of raw milk, bulk milk heat treated for transportation or pasteurised milk taken at the heat treatment establishment and intended for immediate testing.* All samples of milk shall be examined as soon as possible after arrival at the testing laboratory. If a sample is not examined immediately it shall be kept at a temperature not higher than 5°C. until examined, provided that any sample on which the test is not begun within 24 hours of taking such sample shall be discarded.

- (b) *Any sample of pasteurised milk taken at the heat treatment establishment and intended for incubation before testing.* On arrival at the testing laboratory the sample shall be placed unopened in an incubator at a temperature of  $6^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  and shall be retained at that temperature for a period of 5 days, provided that, where these incubation requirements are not begun immediately after the arrival of the sample at the laboratory, the sample shall be kept at a temperature not higher than  $5^{\circ}\text{C.}$  until the start of the prescribed incubation period. Any sample on which the incubation requirements are not begun within 24 hours of taking such sample shall be discarded.
- (c) *Any sample of sterilised or ultra heat treated milk taken at the heat treatment establishment.* On arrival at the testing laboratory the sample shall be placed unopened in an incubator at a temperature of  $30^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  and shall be retained at that temperature for a period of 15 days.
- (d) *Any sample of ultra heat treated milk taken after it leaves the heat treatment establishment and before delivery to the consumer.* On arrival at the testing laboratory the sample shall be placed unopened in an incubator at a temperature of  $30^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  and shall be retained at that temperature for a period of 24 hours.

#### Culture medium

3. Bacterial count. The medium to be used shall be yeastrel milk agar, either compounded in the laboratory or prepared in accordance with the manufacturer's directions from a granular desiccated medium and shall have the following composition:-

Yeastrel	3.0 grams
Peptone	5.0 grams
Agar	15.0 grams
Milk (fresh or spray-dried, skim or whole milk)	10.0 ml.
Distilled water	to 1 litre

Where the medium is compounded in the laboratory it shall be filtered through a pulp-paper filter.

The medium shall be sterilised either by autoclaving at  $121^{\circ}\text{C.}$  for 20 minutes or in a steamer for 30 minutes on three successive days.

The final reaction of the medium at room temperature shall be pH 7.2.

#### Dilutions

4. Quarter-strength Ringer's solution shall be used. The composition of full-strength Ringer's solution shall be-

Sodium chloride	9.00 grams
Potassium chloride	0.42 grams
Anhydrous calcium chloride	0.24 grams
Sodium bicarbonate	0.20 grams
Distilled water	1,000 ml.

Add 1 part of the above solution to 3 parts of distilled water. Fill into test tubes or bottles and sterilise by autoclaving at  $121^{\circ}\text{C.}$  for 15 minutes. The quantity to be filled into the container before sterilisation must be predetermined to allow for evaporation losses during sterilisation.

Alternatively, sterile tubes and bottles may be filled aseptically with measured quantities of sterile quarter-strength Ringer's solution.

#### Technique of tests

5.—(1) The sample shall be mixed thoroughly by shaking and the container opened with aseptic precautions. For the colony plate count the dilutions specified in sub-paragraphs (2) to (5) below shall be used. For each sample being tested not less than two plates shall be prepared. The Petri plates shall be incubated as specified in sub-paragraphs (2) to (5) below.

(2) *Any sample of raw milk, bulk milk heat treated for transportation or pasteurised milk taken at the heat treatment establishment and intended for immediate testing.* For raw milk and milk which has been heat treated elsewhere, 1 ml. of 1 in 1,000 dilution shall be plated. For milk pasteurised on the premises, 1 ml. of 1 in 100 dilution shall be plated. All plates shall be incubated at  $30^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  for 72 hours.

(3) *Any sample of pasteurised milk taken at the heat treatment establishment and intended for incubation before testing.* 1 ml. of 1 in 1,000 dilution shall be plated and the plates incubated at  $21^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  for 25 hours.

(4) *Any sample of sterilised or ultra heat treated milk taken at the heat treatment establishment.* 1 ml., undiluted, shall be plated and the plates incubated at  $30^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  for 48 hours.

(5) *Any sample of ultra heat treated milk taken after it leaves the heat treatment establishment and before delivery to the consumer.* 1 ml. of 1 in 10 dilution shall be plated and the plates incubated at  $30^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  for 48 hours.

**Examination of cultures**

6. All colonies (including "pin-point" colonies) on each plate shall be counted and the arithmetic mean count obtained. To facilitate counting it is desirable to use a counting chamber, a suitable lens and a tally counter. The result of the count shall be recorded as the number of bacteria per ml. and shall be to the nearest 10, 100 or 1,000 according to whether a dilution of 1 in 10, 1 in 100 or 1 in 1,000 has been used.

**General precautions**

7.—(1) The sterility of the media and apparatus shall be tested by carrying out a blank test using sterile water in place of milk when each batch of samples is examined.

(2) Before the dilutions are prepared, the milk shall be thoroughly mixed by inverting the bottle 25 times.

(3) Each dilution shall be thoroughly mixed without vigorous shaking.

(4) In the preparation of the dilutions a separate sterile pipette shall be used for each dilution and for transferring the dilution to the Petri plate or bile salt broth.

(5) The pipettes shall be straight-sided, of the "blow-out" type and plugged with cotton wool.

(6) Not more than 15 minutes shall elapse between the dilution of the milk and its admixture with the agar medium or bile salt broth.

(7) The melted agar shall be cooled to 45°C. before it is poured into the Petri plates.

(8) If Petri plates are stacked in the incubator, so far as possible no stack shall consist of more than six Petri plates.

(9) The temperature of the incubator shall be frequently checked by means of a thermometer conforming to the British Standards Institution's specification and adjusted if necessary.

(10) Bile salt broth tubes showing any air in the Durham tube shall not be used to carry out the test.

(11) Distilled water – water prepared with a glass still or water of equal quality shall be used.

**Part II****THE COLIFORM TEST FOR PASTEURISED SEMI-SKIMMED AND SKIMMED MILK****General**

1. In testing samples of milk for the presence of coliform bacteria the following paragraphs of this Part of this Schedule shall be complied with.

**Treatment of sample before testing**

2. All samples of milk shall be examined as soon as possible after arrival at the testing laboratory. If a sample is not examined immediately on arrival at the testing laboratory, it shall be kept at a temperature not higher than 5°C. until examined, provided that any sample on which the test is not begun within 24 hours of taking such sample shall be discarded.

**Culture medium**

3. Coliform test. The medium to be used shall be bile salt lactose broth, either compounded in the laboratory or prepared in accordance with the manufacturer's directions from a granular desiccated medium and shall have the following composition:—

Peptone	20.0 grams
Bile salts	5.0 grams
Sodium chloride (A.R.)	5.0 grams
Lactose (A.R.)	10.0 grams
Distilled water	to 1 litre
Brom-cresol purple (1.6%)	2.5 ml.

The medium shall be tubed in 5 ml. quantities in 150 x 16 mm. tubes provided with a rimless Durham tube (50 x 6.5 mm.) and sterilised either by autoclaving at 121°C. for 15 minutes or in a steamer for 30 minutes on three successive days.

The final reaction of the medium at room temperature shall be pH 7.2.

**Dilutions**

4. Quarter-strength Ringer's solution shall be used. The composition of full-strength Ringer's solution shall be—

Sodium chloride	9.00 grams
Potassium chloride	0.42 grams
Anhydrous calcium chloride	0.24 grams
Sodium bicarbonate	0.20 grams
Distilled water	1,000 ml.

Add 1 part of the above solution to 3 parts of distilled water. Fill into test tubes or bottles and sterilise by autoclaving at 121°C. for 15 minutes. The quantity to be filled into the container before sterilisation must be predetermined to allow for evaporation losses during sterilisation.

Alternatively, sterile tubes and bottles may be filled aseptically with measured quantities of sterile quarter-strength Ringer's solution.

#### Technique of tests

5.—(1) The sample shall be mixed thoroughly by shaking and the container opened with aseptic precautions.

(2) In testing samples of milk taken at the heat treatment establishment after pasteurisation 1 ml. of milk shall be added to each of three tubes of the culture medium.

(3) In testing samples of milk taken after pasteurisation and after it leaves the heat treatment establishment but before delivery to the consumer 1 ml. of 1 in 100 dilution shall be added to each of three tubes of the culture medium.

(4) The coliform cultures shall be incubated at 30°C.  $\pm$  0.5°C. for 72 hours.

#### Examination of cultures

6. The culture tubes shall be examined for the production of acid and gas after the required period of incubation. Those tubes showing acid and gas production in the Durham tube shall be considered to be positive.

#### Interpretation

7.—(1) If acid and gas production is absent from two of the three tubes the portion of the sample which has been tested shall be presumed to contain no less than one coliform.

(2) The result of the test shall be recorded as less than 1 per ml. where 1 ml. of milk has been used as the inoculum, and as less than 100 per ml. where 1 ml. of 1 in 100 dilution of the milk has been used as the inoculum.

#### General precautions

8.—(1) The sterility of the media and apparatus shall be tested by carrying out a blank test using sterile water in place of milk when each batch of samples is examined.

(2) Before the dilutions are prepared, the milk shall be thoroughly mixed by inverting the bottle 25 times.

(3) Each dilution shall be thoroughly mixed without vigorous shaking.

(4) In the preparation of the dilutions a separate sterile pipette shall be used for each dilution and for transferring the dilution to the bile salt broth.

(5) The pipettes shall be straight-sided, of the "blow-out" type and plugged with cotton wool.

(6) Not more than 15 minutes shall elapse between the dilution of the milk and its admixture with the bile salt broth.

(7) The temperature of the incubator shall be frequently checked by means of a thermometer conforming to the British Standards Institution's specification and adjusted if necessary.

(8) Bile salt broth tubes showing any air in the Durham tube shall not be used to carry out the test.

(9) Distilled water – water prepared with a glass still or water of equal quality shall be used.

### Part III

#### THE PHOSPHATASE TEST FOR PASTEURISED SEMI-SKIMMED AND SKIMMED MILK

##### Treatment of sample before testing

1. The sample of milk shall be examined as soon as possible after arrival at the testing laboratory. If it is not examined immediately on arrival at the testing laboratory, it shall be kept at a temperature not higher than 5°C. until examined. The sample shall be raised to room temperature immediately before being tested.

**Precautions**

2. The following precautions shall be taken:—
  - (a) a sample which shows evidence of taint or souring shall not be tested;
  - (b) the test shall not be carried out in direct sunlight;
  - (c) all glassware shall be clean immediately before use;
  - (d) a fresh pipette shall be used for each sample; pipettes shall not be contaminated with saliva;
  - (e) distilled water shall be used throughout.

**Reagents**

- 3.—(1) Reagents of analytical quality shall be used.
- (2) The buffer-substrate solution shall be prepared as follows:—
  - (a) buffer solution: 3.5 g. of anhydrous sodium carbonate and 1.5 g. of sodium bicarbonate shall be dissolved in distilled water, and made up to one litre;
  - (b) substrate: Disodium p-nitrophenyl phosphate. The solid substrate shall be kept in a refrigerator;
  - (c) buffer-substrate solution: 0.15 g. of the substrate shall be placed in a 100 ml. measuring cylinder or graduated flask, and made up to 100 ml. with the buffer solution. The solution shall be stored in a refrigerator and protected from light. It shall give a reading of less than the standard marked 10 on the comparator disc A.P.T.W. or A.P.T.W.7 when viewed in transmitted light through a 25 mm. cell in the "all purposes" comparator, distilled water being used for comparison. The solution shall not be used for more than one week.

**Apparatus**

4. The following apparatus shall be used:—
  - (a) a Lovibond "all purposes" comparator complete with stand for work in reflected light;
  - (b) a Lovibond comparator disc A.P.T.W. or A.P.T.W.7;
  - (c) two fused glass cells, 25 mm. depth;
  - (d) a water bath or incubator capable of being maintained at  $37.5^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$ ;
  - (e) a pipette to deliver 5.0 ml.;
  - (f) a supply of 1.0 ml. straight-sided pipettes of an accuracy equal to N.P.L. Grade B;
  - (g) a 1,000 ml. graduated flask;
  - (h) a 100 ml. measuring cylinder or 100 ml. graduated flask;
  - (i) a supply of 150 x 16 mm. test tubes conforming to B.S.3218:1982, 150/16, with rubber stoppers to fit.

**Care of apparatus**

- 5.—(1) After use, each test tube shall be emptied, rinsed in water, well washed in hot water containing soda, rinsed in warm water, rinsed in distilled water and finally dried.
- (2) If after treatment in accordance with sub-paragraph (1) hereof a test tube does not appear to be clean, the treatment shall be repeated with the addition that after being rinsed in warm water it shall be soaked in 50 per cent. commercial hydrochloric acid and then rinsed again in warm water before being rinsed in distilled water and finally dried.
- (3) New glassware shall be cleaned and free from contamination from substances which may interfere with the test.
- (4) Glassware used for the test shall not be used for any other purpose and shall be kept apart from all other apparatus in the laboratory.

**Method of carrying out the test**

6. 5 ml. of the buffer-substrate solution shall be transferred to a test tube using a pipette and the test tube shall be stoppered and brought to a temperature of  $37^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  1 ml. of the milk to be tested shall be added, the test tube stopper replaced and the contents well mixed by shaking. The test tube shall then be incubated for exactly two hours at  $37^{\circ}\text{C.} \pm 0.5^{\circ}\text{C.}$  One blank prepared from boiled milk of the same type as those undergoing the test shall be incubated with each series of samples. (Where the sample consists of highly coloured milk, such as homogenised milk or milk from Channel Island cows, a separate blank of such milk shall be prepared.) After incubation the test tube shall be removed from the water bath and its contents shall be well mixed. The blank shall be placed on the left hand ramp of the stand and the test sample on the right. Readings shall be taken in reflected light by looking down on to the two apertures with the comparator facing a good source of daylight (preferably north light). If artificial light is needed for matching, a "daylight" type of illumination must be used. The disc shall be revolved until the test sample is matched. Readings falling between two standards shall be recorded by affixing a plus or minus sign to the figure for the nearest standard.

## Part IV

## THE TURBIDITY TEST FOR STERILISED SEMI-SKIMMED AND SKIMMED MILK

**Treatment of sample before testing**

1. The sample of milk shall be examined at any time after delivery to the testing laboratory but shall be at room temperature when the test is begun.

**Reagent**

2. Ammonium sulphate A.R. shall be used.

**Apparatus**

3. The following apparatus shall be provided:-

- (a) a supply of conical flasks, 50 ml. capacity;
- (b) a supply of graduated cylinders, 25 ml. capacity;
- (c) a supply of 150 × 16 mm. test tubes conforming to B.S.3218:1982, 150/16;
- (d) a supply of filter funnels, 6 cm. diameter;
- (e) two beakers, 400 ml. capacity;
- (f) a supply of Whatman filter papers, 12.5 cm. No. 12.

**Method of carrying out the test**

4. The test shall be carried out in the following manner:-

- (a) weigh  $4 \pm 0.1$  g. of ammonium sulphate A.R. into a 50 ml. conical flask. Measure out  $20 \pm 0.5$  ml. of the milk sample, and pour into the conical flask. Ensure that the ammonium sulphate dissolves by shaking for three minutes. Leave for not less than five minutes and then filter through a folded paper (Whatman 12.5 cm. No. 12) into a test tube. When not less than 5 ml. of a clear filtrate have collected, place the tube in a beaker of water, which is kept boiling, and keep it therein for five minutes. Transfer the test tube to a beaker of cold water;
- (b) when the tube is cool, examine the contents for turbidity by moving the tube in front of an electric light shaded from the eyes of the observer, and comparing each tube with a control tube prepared as directed in the next succeeding paragraph.

**Control tubes**

5. A sample of laboratory-sterilised milk shall be prepared by heating milk for at least twenty minutes after it has reached boiling point in a vessel placed in a boiling water bath. Control tubes shall be prepared by taking a sample of laboratory-sterilised milk and subjecting it to the test procedure detailed in subparagraph (a) of the last foregoing paragraph.

Regulation 8

**SCHEDULE 5**  
**REVOCATIONS**

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<i>Regulations revoked</i>	<i>References</i>
The Milk and Dairies (Semi-skimmed and Skimmed Milk) (Heat Treatment and Labelling) (Scotland) Regulations 1974	S.I. 1974/1356
The Milk and Dairies (Semi-skimmed and Skimmed Milk) (Heat Treatment and Labelling) (Scotland) Amendment (No.2) Regulations 1983	S.I. 1983/1526
The Milk and Dairies (Semi-skimmed and Skimmed Milk) (Heat Treatment and Labelling) (Scotland) Amendment Regulations 1986	S.I. 1986/791
The Milk and Dairies (Semi-skimmed and Skimmed Milk) (Heat Treatment and Labelling) (Scotland) Amendment Regulations 1988	S.I. 1988/1815

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**EXPLANATORY NOTE**

*(This note is not part of the Regulations)*

These Regulations re-enact with modifications the Milk and Dairies (Semi-skimmed and Skimmed Milk) (Heat Treatment and Labelling) (Scotland) Regulations 1974, as amended, and make provision for the implementation of Council Directive 85/397/EEC (OJ No. L226, 24.8.1985, p.13) on health and animal health problems affecting intra-Community trade in heat-treated milk.

The Regulations require that semi-skimmed milk or skimmed milk sold for human consumption shall have been heat treated in accordance with the Regulations (regulation 3 and Schedules 1 and 2). They include provision for sampling (regulation 3(2)(c) and Schedule 3) and for tests (regulation 3(2)(d) and Schedule 4).

The Regulations do not apply to semi-skimmed and skimmed milk imported heat treated in closed containers for delivery as drinking milk to consumers (regulation 7).

In addition to drafting amendments, it makes the following changes of substance:-

- (a) in addition to the requirement to keep records of the quantities of milk purchased and sold, every milk processor and every milk purveyor is required to keep records of milk delivered, other than by way of purchase or sale (Schedule 1, paragraph 2);
- (b) as pre-conditions for heat treatment of raw milk it is required that-
  - (i) over the preceding two months not less than two samples of the producer's milk have been taken each month and have satisfied a prescribed average plate count;
  - (ii) in the case of raw milk not heat treated within 36 hours of arrival at the heat treatment establishment, steps have been taken to ensure a prescribed maximum plate count is not exceeded; and
  - (iii) the results of such plate counts are recorded (Schedule 1, paragraphs 8 and 9);
- (c) in any proceedings for a breach of the pre-conditions referred to in paragraph (b) above, evidence of a sample taken or of a plate count carried out in accordance with Schedule 3 or Part I of Schedule 4, respectively, is to be preferred to evidence of a sample taken or of a plate count carried out by any other method (Schedule 1, paragraph 10);
- (d) a sample of milk taken in specified circumstances is required to satisfy a new plate count test (Schedule 2, Part I, paragraph A7, Part II, paragraph 6, Part III, paragraph A6 and Schedule 4, Part I);
- (e) in specified circumstances, a sample of milk which is to be subjected to a plate count or coliform test is required to be transported at a prescribed temperature (Schedule 3, paragraph 3(3)).

Information as to British Standards referred to in these Regulations can be obtained by post from the British Standards Institution at Milton Keynes or from any of the Institution's sales outlets.