The International Egg Commission

GUIDELINES FOR THE HYGIENIC PRODUCTION AND DISTRIBUTION OF EGGS AND EGG PRODUCTS

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INTERNATIONAL EGG COMMISSION

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I General

Introduction

1. It is clearly impossible to lay down a code of practise for the hygienic production and distribution of eggs and egg products throughout the whole world. What this paper attempts to do is to suggest ideas on which the industry in each country can draw in creating its own code of practice. Veterinary advice should be sought in the preparation of such a code of practice.

The Chain

2. It is important that the hygienic chain is maintained from breeding flocks/hatcheries right through to the final consumer. Pullet rearers should only obtain birds from breeders/hatcheries who are conforming with the code of practice, egg producers should only obtain birds from pullets rearers who are following the code of practice, packers should only receive eggs from producers who are following the code of practice and should insure that instructions for the hygienic keeping of eggs are passed on to their retailer/caterer customers and to the final consumer. So far as possible egg processors should source their raw materials from producers and packers following the code of practice.

Traceability

3. It is important to provide for the traceability of poultry, eggs and feed. Hatcheries, rearers, laying flocks and packing stations involved in producing and handling eggs under the code should be registered with the Code Authority. As the birds move from hatchery to rearing farms and eventually to laying farms they could be accompanied by a passport. Establishments providing feed to the birds should be registered with the Code Authority.

Identification

4. It is important that eggs and egg products produced and distributed under the code should be identified by some type of mark. Advertising/PR work can then be built around the mark to encourage clients and consumers to purchase eggs and egg products which have been produced and distributed under the code of practice.

Legal

5. The sponsors of a code of practice in any particular country will need to check their legal liability under the law of their land.

Enforcement

6. Consideration will need to be given to the degree of enforcement of the code provisions. Self audlt, using agreed forms, backed by external audits from and independent monitoring agency are essential to give credence to the code.

II Eggs

Special Requirements Relating to Breeding Flocks/Hatcheries

7. Parent breeding flocks should not be kept on the same holding as grandparent or elite breeding flocks. Unique genetic material should be kept in more than one building and on more than one holding. Birds of only one age should be kept on an “all-in-all-out” farm and should be obtained from a single source and should be kept inside the buildings.

8. All eggs intended for incubation should be sanitised on the day of lay.

9. At hatcheries, eggs should be collected from breeding farms regularly; only clean eggs should be collected for incubation and should be sanitised. A one-way system for the flow of eggs and chicks should be operated. Adequate ventilation should be provided.

Salmonella Control

10. In countries where salmonella is a problem special control measures are necessary. Appropriate procedures should be laid down for the testing of birds, eggs and the environment.

11. For breeding flocks and chicks in hatcheries procedures should be established for dealing with situations in which contamination is discovered.

12. In pullet rearing flocks birds should be tested as late as possible, commensurate with the rules laid down for dealing with positives, prior to the supply of pullets to the laying flocks.

13. In laying flocks the birds should be tested one week before depletion in order to determinate the degree of sanitising which is needed before the laying house is refilled with birds.

14. Because of the proven difficulties of removing salmonella enteritldls infections from the environment, in countries where S.e. is a problem the birds intended for flocks producing eggs under the Code should be vaccinated.

Location of Poultry Buildings

15. Where possible poultry buildings should be located away from other farm holdings and ideally the perimeter of the farm should be fenced and gated securely with parking facilities away from the buildings. The site should be kept clean and tidy.

Construction of Poultry Buildings

16. Buildings should be sound in structure and repair and constructed in a way that prevents the entry of wild birds and rodents and infestation by insects. Wherever possible surfaces should be smooth and impervious. All insulation materials should be odourless and rot proof. Materials which cannot be cleaned easily should not be used. Floors should be proofed against rot and water, easy to clean and laid in a way which facilitates the drainage of water. Ancillary rooms (e.g. food stores, egg stores, changing rooms, break rooms, toilets, equipment and other stores) should be a similar standard to those of livestock buildings.

Staff

17. Staff should be trained in hygiene control. Each farm should produce its own manual of working instructions, which contains a check list of routine hygiene and husbandry tasks, for use by staff. Foot baths, adequate hand washing and toilet facilities should be provided and regular use encouraged. Protective clothing should be provided, changed and laundered regularly, smoking and the consumption of food should only be allowed in specified areas.

Vermin Control

18. Poultry houses and ancillary building should be wild bird and rodent proof and effective measures should be taken to control vermin and flies and other arthropods including the elimination of potential breeding areas. Rodent control is enhanced by the control of vegetation around the buildings. A vermin control book should be kept.

Sanitising

19. Sanitising should be carried out between flocks using approved, or recognised, disinfectants. Steam cleaning may be used where possible and appropriate. Particular attention should be paid to equipment such as ventilation systems, feeders, drinkers, waterlines and header tankers all of which should be sanitised. In countries where salmonella is a problem cultures should be taken from the environment where positives of the birds have been found. After sanitising has been carried out further cultures should be taken and restocking should not take place until all samples are negative. In deep pit houses, when positives are found the pit should be cleaned out and sanitised.

Domestic Animals

20. Domestic animals should not be allowed into poultry houses or ancillary buildings.

Visitors

21. Visitors should be kept to the minimum necessary and must be subjected to the same degree of hygiene control as staff.

Transport

22. All vehicles (and equipment) used for catching and transporting poultry are high risk items. Cleansing and disinfection is a high priority before and after each occasion on which these items are used. Ideally, dedicated transport and equipment should be used.

Feed

23. Feed should only been sourced from establishments producing feed to a standard agreed by the Code Authority.

24. Vehicles used for carrying raw ingredients should not be used for carrying finished feeds until they have been effectively cleaned.

25. All appropriate measures should be taken to prevent the recontamination of feed during its storage and distribution on the farm. Particular attention should be paid to the cleanliness of the bulk storage bins, augers, hoppers and chain feeders.

General Equipment

26. A clean and tidy store of equipment and tools should be maintained free of obsolescent equipment and rubbish. Equipment should be cleaned after each use and before storage.

Litter

27. All used litter should be incinerated of removed from the site.

Birds

28. Any sick or infected birds should be culled as soon as they are identified. Dead birds should be collected promptly and placed in a waterproof, leak proof, container ready for incineration or for immediate removal from the site.

Extensive Flocks

29. It should be borne in mind that hygiene control is more difficult in extensive egg production systems. For example, free range units obviously cannot be rodent and wild bird proof. Every effort should be made by the producers to maintain, as far as possible, the standards or practice laid out in the code.

On Farm Handling of Eggs

30. Staff handling eggs for human consumption should be taught to regard themselves as food handlers and should be carefully trained in hygiene. They should wash there hands before and after collection.

31. Eggs should be collected frequently and dirty eggs, cracked and broken eggs should be removed from the collection system as soon as possible. Dirty and cracked eggs should only go for human consumption via a pasteurising/processing plant. Broken eggs (i.e. where both the shell and membrane are broken) and incubated eggs which have not hatched should not be used as food for human consumption.

32. Prior to distribution eggs should be stored in rooms separate from poultry. They should be kept at a constant temperature and below 20˚C and stored in the correct conditions to avoid surface condensation. All egg production and packing units, equipment and transport should be kept in a hygienic condition and regularly cleaned. Lorries collecting them should be visibly clean. Arrangements should be made with packers to return egg trays to the individual premises from which they originated. Dirty of soiled trays should not be used.

33. The laying house should be kept clean and as free as possible from broken liquid egg. Dead and culled birds should be removed before the collecting is run and egg belts should be regularly cleaned, serviced and maintained.

34. There should be an effective and well maintained system of manure removal to prevent faecal contamination of eggs and feed troughs.

Distribution of Eggs from Farm to Consumer

35. Eggs should be stored and transported within a system which avoids excessive temperature fluctuations and where the temperature does not exceed 20˚C. Eggs should be sold under a "best before" date which will ensure that the eggs are consumed within three weeks of the date of lay. In the home or on catering premises eggs should be stored in a refrigerator below 8˚C and appropriate storage information should be included on egg packs.

36. Ideally eggs should be delivered to the packing station as soon as possible after lay and within a maximum period of three days of lay.

37. All egg movement is to be accompanied by written documentation giving proof, in particular, of the farm of origin.

38. The premises at packing stations should be reserved for the handling and storage of eggs. They should be so built and equipped that they afford suitable ventilation and adequate lighting and can be properly cleaned and disinfected. They should be of sufficient area in relation to the volume of work done and include all the necessary technical equipment to ensure the proper handling of eggs. The premises and equipment should be kept in good repair and free of extraneous odours.

39. Good manufacturing practise must be adhered to at packing stations with written HACCP controls to include adequate cleaning procedures; traceability of product and records to be maintained at all times; written product re-call procedures to be in place. In countries where S.e. is a problem there should be post-cleaning swabbing for S.e. and sample testing of eggs from each farm each quarter.

40. Set levels of hygiene relevant to the handling of food must be adhered to. Effective crack and blood detection must be used in the grading of eggs. Records should be held on site for a minimum of two years. Egg boxes should carry storage instructions for the consumer or caterer.

41. Retailers should be advised that eggs

    (a) Should be stored in there outer boxes, prepacks or keyes trays in a clean, dry place away from strong smelling foods and possible contaminants;

    (b) Should not be stored or displayed

        (I) Near to heat sources such as fridge motors or fan heaters.

        (II) In shop windows or direct sunlight.

    (c) Should be isolated from any pre-cooked or raw foods and hands should always be washed prior to and after handling.

    (d) So far as possible should be sold in strict rotation i.e. first in, first out; ideally, display cabinets should be cleared completely twice a week.

42. On catering premises or in the home eggs should be stored, preferably in their packs, in a refrigerator.

III Egg Products

General

43. The principals laid down for the production of eggs in relation to the construction of premises, hygiene of staff and equipment and the control of rodents and vermin apply equally to egg processing plants.

Layout of Premises

44. There should be separate rooms for:

    (a) The storage or eggs;

    (b) The storage of liquid/frozen egg arriving at the plant;

    (c) For the breaking of eggs, collecting their contents and removing their shells;

    (d) For the treatment of the egg contents;

    (e) For the storage of the treated egg products;

    (f) For the storage of additives;

    (g) For the storage of cleaning and disinfectant products;

    (h) For the preparation of products not intended for human consumption.

Raw Material

45. Eggs obtained from other species (e.g. duck, geese, turkeys, guinea fowls or quail) should not be mixed with hen egg products for human consumption.

46. Unhatched eggs from incubators and broken eggs (i.e. where both the shell and membrane are broken) should not be used for the production of egg products used for human consumption.

47. Dirty eggs should be cleaned before being broken. Eggs should be cleaned in a way which prevents contamination of the egg contents and the shells dried before breaking.

48. As far as possible eggs should be sourced from producers who are following the code of practise.

49. Eggs for the production of products for human consumption should not be broken by centrifuging or crushing and centrifuging should not be used to obtain the remains of egg white from empty shells. Shells and membranes should be kept out of the products as far as possible. Shell eggs should be stored in cool conditions at a constant temperature of below 20˚C and processed within seven days of receipt. Eggs held below 8˚C throughout the production/distribution chain may be processed within eight weeks.

50. Containers of eggs arriving at the processing plant should be clearly labelled to give the name of the farm or packing station and the date of packing. The date of receipt at the processing plant should be marked on the containers.

51. Cracked eggs should be broken as soon as possible.

52. Where liquid egg is brought in from a packer or from another processing plant it should either have been deep frozen or chilled to a temperature of not more than 4˚C at the place where the eggs were broken. Chilled egg should be treated within 48 hours following the day of breaking the eggs.

53. A technically qualified person from the processing plant should inspect the suppliers of their eggs/products on a regular basis and at least annually.

Staff

54. Staff should be trained in hygiene requirements and to inspect and reject unsuitable eggs and/or consignments. They should be required to produce a medical certificate indicating that there is no reason why they should not engage in the handling of eggs or egg products. The medical certificate should be updated yearly unless a staff medical check-up scheme is in operation.

Finished Products Standards

55. Eggs products should undergo suitable treatment which will enable the finished product to meet the finished products standards laid down under the code. (Typical values are set out in Annex A).

Analytical Standards

56. Analytical standards should be laid down (See Annex B for suggested standards).

57. The analysis and test methods used should be recognised internationally.

58. A sample from each day's production of each type of product should be kept and frozen for at least one month for use as a reference. If the reference sample has been taken from a batch where part or all has been sold frozen the sample should be kept for at least four months.

Additives

59. Where salt or sugar is added to the egg product, this should be carried out prior to pasteurisation. Where this is not possible, then salt and sugar should be sieved prior to adding post pasteurisation.

Freezing/Defrosting Procedure

60. The freezing of products should be carried out rapidly using blast freezing techniques and be solidly frozen within eighteen hours maximum.

61. Defrosted egg should be repasteurised before despatch. It should not be left to defrost at ambient temperatures. In its frozen form it should be put through a block chipper and in to a steam/water jacketed stainless steel vat which does not operate higher than 60˚C. The defrost process should be completed within two hours and egg repasteurised within a further two hours.

Packaging

62. Egg products should be packaged in hygienic conditions which ensure they are not contaminated, do not impair the organoleptic characteristics of the product and cannot transmit to the egg products substances harmful to human health. They should be strong enough to protect the egg products adequately. They should be clean prior to being filled and reusable containers should be cleaned, disinfected and rinsed before being filled again.

63. Immediately after packaging the containers should be closed and placed in a separate storage room.

64. Containers which are used for the transport of egg products in bulk should have there inside surfaces made of a material which is easy to wash, clean and disinfect and can resist corrosion. They should be designed so that the egg product can be removed completely and any taps should be easy to remove, dismantle, wash clean and disinfect. The containers should be washed, cleaned, disinfected and rinsed immediately after each use. They should be sealed after being filled and remain sealed during transportation until they are used. They should be reserved for the transport of egg products.

Storage and Transport

65. During storage and transport the temperature should not exceed the following values:

Deep frozen products	-18˚C
Frozen products	-12˚C
Chilled products	+4˚C

Water Supply

66. Only potable water should be supplied except for steam production, fire fighting and the cooling of refrigeration equipment provided that the steam and water concerned may not come in to contact with the egg products or be used for cleaning or disinfecting containers, plant or equipment which comes in to contact with egg products. Pipes carrying non-potable water should be clearly distinguished from those carrying potable water.

Cleaning

67. Detailed written cleaning schedules should be available for all items of equipment (including returnable delivery containers) and for all parts of the manufacturing environment. There should be a system, with appropriate signatures, for recording that the schedules are being adhered to. Swabs should be used on a regular basis to monitor the efficiency of the cleaning. Where cleaning in place systems are used, there should be separate systems for raw and pasteurised lines. Detergents should be of food quality and compatible with terminal sanitizers.

Records

68. Appropriate records of functions and procedures should be kept.

Marking of Egg Products

69. Every consignment of egg products leaving a processing establishment should bear a label showing the temperature at which the egg products must be maintained and the period during which their conservation may thus be assured. Information on shelf life and storage conditions should be clearly shown.

Registration and Monitoring

70. Processing plants providing products under the code should be registered with the Code Authority. Such plants should be monitored by an independent agency.

ANNEX A

EGG PRODUCTS: FINISHED PRODUCTS STANDARDS: TYPICAL VALUES

Liquid Chilled Frozen	Moisture (max. %)	Total Solids (Min. %)	Fat (min. AOAC)	Free Fatty acids (AOAC)	pH
Whole egg	-	23.0	10.3	max.3.5	7.2 -7.7
Egg white	-	10.5	-	-	min.9.0
Yolk	-	43.0	27.0	max.3.5	6.0-6.5
DRIED EGG:					
Spray dried Whole egg	5.0	-	39.0	max.3.5	-
Albumen Pan dried	16.0	-	-	-	-
Spray dried	8.0	-	-	-	-
Yolk spray	5	-	56.0	max.3.5	-

ANNEX B

EGG PRODUCTS: SUGGESTED ANALYTICAL STANDARDS

1. Microbiological criteria

(a) Salmonellae: absence in 25g or ml of egg product

(b) Other criteria:

- mesophillic aerobic bacteria: M = 10^5 in 1g or 1ml
- enterobacteriaceae: M = 10^2 in 1g or 1ml
- staphylococcus aureus: absence in 1g of egg product

M = maximum value for the number of bacteria; the result is considered unsatisfactory if the number of bacteria in one or more sample units is M or more.

2. Other Criteria

(a) The concentration of 3 OH-butyric acid must not exceed 10mg/kg in the dry matter of the unmodified egg product.

(b) The lactic acid content must not exceed 1000mg/kg of egg product dry matter (applicable only to the untreated product).

- The succinic acid content must not exceed 25mg/kg of egg product dry matter.

In the case of fermented products these values are those recorded before the fermentation process.

(c) The quantity of eggshell remains, egg membrane and any other particles in the egg product must not exceed 100mg/kg of egg product.

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Further information about this or any other IEC publications is available by contacting the IEC office:

The Director General
The International Egg Commission
89 Charterhouse Street
London
EC1M 6HR
United Kingdom

Tel: +44 20 7490 3493
Fax: +44 20 74903495
Web: www.internationalegg.com