

codex alimentarius commission



FOOD AND AGRICULTURE
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Agenda Item 9

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JOINT FAO/WHO FOOD STANDARDS PROGRAMME CODEX COMMITTEE ON FOOD HYGIENE

**Thirty-fifth Session
Orlando, Florida, USA, January 27 – February 1, 2003**

PROPOSED DRAFT REVISION OF THE CODE OF HYGIENIC PRACTICE FOR EGG PRODUCTS (CAC/RCP 15-1976 (AMENDED 1978, 1985))

Prepared by Australia with assistance of Canada, , Italy , Netherlands, United Kingdom, United States of America, and the Asociacion Latino Americana de Avicultura (ALA)

Governments and interested international organizations are invited to submit comments or information on the attached Proposed Draft Revised Code at Step 3 (see Appendix) and should do so in writing in conformity with the Uniform Procedure for the Elaboration of Codex Standards and Related Texts (see *Procedural Manual of the Codex Alimentarius Commission, Twelfth Edition*, pages 19-20) **to:** Mr. S. Amjad Ali, Staff Officer, Food Safety and Inspection Service, U.S. Department of Agriculture, Room 4861, 1400 Independence Avenue, SW, Washington, D.C. 20250, USA, FAX +1-202-720-3157, or email syed.ali@fsis.usda.gov with a copy **to:** Secretary, Codex Alimentarius Commission, Joint WHO/FAO Food Standards Programme, FAO, Viale delle Terme di Caracalla, 00100 Rome, Italy, by FAX +39-06-5705-4593 or email codex@fao.org **by November 25 2002.**

BACKGROUND

The Codex Committee on Food Hygiene (CCFH), at its 32nd (2000) Session of CCFH requested the Delegation of Australia to prepare a document on the priorities for the revision of Codex codes of hygienic practice which would include the identifying of: 1) which codes were superseded; and, 2) which codes could be combined.

At the 33rd session of CCFH, Australia introduced the document CX/FH 00/14, which was prepared with the assistance of its drafting partners. The Committee agreed that some codes of practice could be combined and revised on a commodity basis. Subsequently CCFH agreed to revise the Code of Hygienic Practice for Egg Products (the Code), pending the approval of the Commission. The 49th Session of the Executive Committee approved the revision as new work.

The Committee recognized the necessity for revision of the Code due to the important public health aspects of the Code and the long period since its original development. It was noted that the

microbiological risk assessment on Salmonella in eggs and poultry to be finalized by FAO and WHO would be useful for the revision of the Code. The Committee agreed that Australia, with the assistance of the United States and Asociacion Latino Americana de Avicultura (ALA) would prepare an initial document for consideration at the 34th session of CCFH.

At the 34th Session¹ of CCFH, Australia on behalf of its drafting partners presented a paper proposing a strategy for the revision of the Code. The paper detailed an outline of elements that were recommended for inclusion in the revised Code, based on the *Recommended International Code of Practice: General Principles of Food Hygiene* (GPFH). The Committee agreed that the revised Code should include eggs in shell in addition to egg products. The Committee also agreed to the general approach in the framework document and returned the document to Step 2 for revision by Australia with the assistance of its drafting partners.

REVISED DOCUMENT

The Drafting Group met 23-25 April 2002 to revise the document based on discussion at the 34th Session of CCFH. The revised document is Appendix to this agenda paper.

The Drafting Group has made significant progress revising the document but recognizes that significant further work is required. The following areas that require particular attention:

- The current document generally consists of a set of principles, without an appropriate level of guidance for implementation. It is likely additional annexes to the Code with more detailed guidance will have to be developed.
- The layout and hierarchy of the sections in the document will have to be revised to simplify the numbering system.
- Further elaboration of a number of sections including definitions is required.

The Code is proposed to include all eggs and egg products of domesticated birds including eggs in shell, and all pasteurized egg products (liquid, frozen, and dried whole eggs, yolks, and whites, with or without added ingredients) and egg substitutes. The Code should also cover new and emerging products and processing technologies.

REQUEST FOR REVIEW

The Committee is invited to comprehensively review the Proposed Draft Revised Code for its appropriateness and adequacy in order to progress with further development of the document.

¹ ALINORM 03/13, paragraphs 152-157

APPENDIX

PROPOSED DRAFT REVISED CODE OF HYGIENIC PRACTICE FOR EGG PRODUCTS
*(CAC/RCP 15-1976, Amended 1978, 1985)***TABLE OF CONTENTS**

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INTRODUCTION

The controls described in this Proposed Draft Revised Code of Hygienic Practice for Egg Products are designed for the safe production of eggs and egg products. The Code supersedes the Recommended International Code of Hygienic Practice for Egg Products (CAC/RCP 15-1976, amended in 1978 and 1985). A hazard analysis approach was used to assist in determining the controls presented in this Code. Three joint FAO/WHO documents were used to provide a risk-based foundation for the revised Code.

- Risk characterization of *Salmonella* spp. in eggs and broiler chickens and *Listeria monocytogenes* in ready-to-eat foods, Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards in Foods, FAO Headquarters, Rome, Italy 30 April – 4 May 2001, which considered the following two preliminary reports;
- Hazard Identification and Hazard Characterization of *Salmonella* in broilers and eggs, Joint FAO/WHO Activities on Risk Assessment of Microbiological Hazards in Foods, Risk Assessment: *Salmonella* spp. In broilers and eggs (MRA 00/03 preliminary report July 2000);
- Exposure assessment of *Salmonella* Enteritidis in eggs, Joint FAO/WHO Activities on Risk Assessment of Microbiological Hazards in Foods, Risk Assessment: *Salmonella* spp. In broilers and eggs (MRA 00/04 preliminary report July 2000).

This Code of Hygienic Practice for Eggs and Egg Products takes into consideration, to the extent possible, the differing egg and egg product production and processing procedures used by countries. This code focuses primarily on domesticated chickens used for egg production, but also considers the differing characteristics, when those differences are important to the hygienic practices used, for eggs produced from all domesticated egg producing birds.

SECTION I - OBJECTIVES

The objective of this Code is to ensure the safety of eggs and egg products drawing on microbiological risk assessment information presented in the Report of the Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards², specifically that related to *Salmonella* spp. in eggs. Control measures selected should be based on their risk reduction potential and the ability of the preferred risk management option(s) to achieve the appropriate level of protection for the hazard(s) in eggs and egg products. This Code has been constructed using an outcomes based approach, recognizing that different sets of scientifically validated control measures can be used to achieve a particular appropriate level of protection.

This document describes specific hygienic and other food safety considerations associated with all methods of production and processing of eggs and egg products, including provisions relevant to small producers and/or those using less developed systems. The approach taken reflects the need to be aware of potential hazards in the procedures and to control and monitor them.

SECTION II - SCOPE, USE AND DEFINITION

2.1 SCOPE

This Code concerns the hygienic production and processing of eggs and egg products of domesticated birds only, intended for human consumption. This Code addresses the two main

². Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards in Foods, FAO Headquarters, Rome, Italy 30 April – 4 May 2001

sources of contamination of eggs - internally during the egg formation, and externally, at any point at or after laying. It takes into consideration the possibility of illness in the general population due to the consumption of eggs or egg products contaminated by Salmonella species, as well as other enteric pathogens or other contaminants, as well as the various susceptible populations including the elderly, children, and immunocompromised patients. For microbiological contamination, this approach is consistent with the approach identified by the Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards in Foods.

2.2 USE

The Code is formatted in accordance with the *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)) (GPFH), and should be read with it. For each section of this Code, where no requirements additional to those contained in the GPFH are needed, it is so noted. Likewise, for those sections of this Code that introduce commodity specific food safety requirements beyond those contained in the GPFH, the specific requirements are detailed.

The GPFH are a prerequisite to the commodity specific requirements in this code. The code also references other Codex Standards, Codes or Guidelines, such as the labeling standards and the Codex Code of Hygienic Practice for the Transport of Foods in Bulk and Semi-Packed Food, when they apply to the hygienic production of eggs and egg products.

2.3 DEFINITIONS

[To be determined, but are proposed to include the following:]

Breaking – the process of cracking the egg shell and separating its pieces to remove the egg contents.

Domesticated birds – members of the Class *Aves* that are subject to human management for the production of eggs for human consumption.

Egg – the ovum in the shell produced by domesticated birds and intended for human consumption, other than eggs that have been in an incubator or those treated to change the functional properties.

Egg laying establishment – the facilities and the surrounding area where primary production of eggs takes place.

Egg product – all, or a portion of, the contents found inside eggs separated from the shell, as well as raw or pasteurized liquid, frozen and dried whole eggs, yolks, and whites, with or without added ingredients, intended for human consumption.

Flock – a group of domesticated birds.

Microorganisms – include yeasts, moulds, bacteria, viruses and parasites. When used as an adjective, the term “microbial” is used.

Packing – putting eggs in packaging.

Potable water – water that meets the quality standards of drinking water such as described in the WHO Guidelines for Drinking Water Quality.

Primary production – those steps involved in managing flocks of domesticated birds and egg laying systems, including egg collection, storage and movement at the egg laying establishment, but not including transportation to a packing facility or other processing facility.

Producer – the person responsible for the management of domesticated birds kept under the same conditions.

SECTION III - PRIMARY PRODUCTION

These guidelines are supplemental to those set forth in Section 3 of the *Recommended International Code of Practice - General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)).

Although this section of the code is aimed at encouraging the safe production of eggs for human consumption, and gives relevant guidance to producers to achieve this, the importance of obtaining laying birds from healthy breeding stock should not be overlooked. Pathogens such as *Salmonella* Enteritidis (SE) can be transmitted vertically from breeder flocks to commercial laying flocks, and hence to eggs. Producers should obtain domesticated birds from breeding stock that have been subject to control measures to reduce and, if possible eliminate, the risk of introducing poultry diseases and pathogenic organisms transmissible to humans into laying flocks. Breeding flocks should also be subject to a programme to monitor the effect of the control measures.

Laying flock management is key to safe primary production of eggs. Laying flocks are managed under a wide range of climatic conditions using various agricultural inputs and technologies, and on farms of various sizes. Hazards may vary between one type of production system and another. In each egg laying establishment, it is necessary to consider the particular agricultural practices that promote the safe production of eggs, the type of products (e.g., unsorted eggs, eggs for table egg market, eggs strictly for breaking) and production methods used.

Procedures associated with primary production should be conducted under conditions that minimize risk to health associated with the external or internal contamination of eggs.

3.1 ENVIRONMENTAL HYGIENE

The evaluation of land prior to its use for free range foraging of domesticated birds, periodic monitoring of the environment and forage, and judicious selection and use of fertilizers and agricultural chemicals are approaches to managing contaminants.

Potential sources of contamination from the egg laying establishment environment should be identified. In particular primary production should not be carried out in areas where the presence of potentially harmful substances would lead to an unacceptable level of such substances in or on eggs.

Where possible, producers should evaluate the previous use of the egg laying establishment (indoor and outdoor) in order to identify hazards. The potential for other types of contamination (e.g., from agricultural chemicals, hazardous wastes, etc.) should also be considered.

The evaluation process should include the following:

- Previous and present usage of the primary production area and the adjoining sites (e.g. crop grown, feed lot, animal production, hazardous waste site, sewage treatment site, mining extraction site) to identify potential microbial hazards including faecal contamination and contamination by organic waste and potential environmental hazards that could be carried to the egg laying establishment.
- The access of domesticated and wild animals to the site and to water sources used in primary production to identify potential faecal contamination of the soils and water and the risk to

eggs. Existing practices should be reviewed to assess the prevalence and likelihood of uncontrolled deposits of animal faeces coming into contact with eggs. Domestic and wild animals should be excluded, as far as possible, from egg laying establishments.

- Potential for contaminating egg laying establishments by leaking or overflowing manure storage sites and flooding from polluted surface waters.

If previous uses cannot be identified, or the evaluation leads to the conclusion that hazards exist, the sites should be analysed for contaminants of concern. If the contaminants are at excessive levels and corrective or preventive actions have not been taken to minimize identified hazards, the sites should not be used until correction/control measures have been applied.

3.2 HYGIENIC PRODUCTION OF EGGS

Provisions in this section are equally relevant for small egg producers and/or those using simple equipment.

3.2.1 *Egg laying establishments*

3.2.1.1 Flock management

Flock management is critical to reducing the risk of human illness from the consumption of eggs. Effective flock management can reduce the prevalence of pathogens in a flock and thereby reduce the risk of human illness. The SE Risk assessment has shown that reducing the prevalence of SE infected flocks is anticipated to result in a reduction in the risk of human illness from the consumption of SE positive eggs³.

- The health status of domesticated birds relative to avian diseases and colonization by pathogenic organisms transmissible to humans should be evaluated.
- Preventive measures, including managing human access, should be taken to reduce the risk of transferring micro-organisms that may impact on food safety to, or from, or between, flocks. Where necessary, visitors should wear appropriate protective clothing.
- Good animal husbandry practices should be used to help maintain flock resistance to colonization by pathogenic organisms, including timely treatment for parasites and minimizing stress through proper management of environmental conditions.
- Where permitted, the use of appropriate vaccines may contribute to an overall flock management program as a preventive measure.
- Birds should only be treated with veterinary drugs permitted for the specific use and in a manner that will not adversely impact on the safety and suitability of eggs, including adherence to the withdrawal period specified.

³ Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards in Foods, FAO Headquarters, Rome, Italy 30 April – 4 May 2001, page 13.

[**Drafting Note:** Fecal testing for SE and use of a vaccination protocol is anticipated to reduce the risk of human illness, however, the actual reduction in risk of illness is dependent on the prevalence of SE within flocks and other variables⁴.]

3.2.1.1.1 Feeding and watering

[**Drafting note:** Feed and water have been found to be a source of contamination, therefore any treatment that can be used to reduce or eliminate Salmonella should be considered⁵.]

- Producers should take care during production (where appropriate), preparation, procurement, storage, and delivery of feed to reduce the risk of introducing hazards into the production system.
- Where practical use potable water, or at least water that is of a quality that does not introduce hazards to humans consuming the eggs.
- Good purchasing practices may include using vendor assurances or contractual agreements to minimize the risk associated with hazards in the feed or water.
- Potential sources of contamination from improperly managed animal and human waste should be identified and controlled to the extent feasible to minimize the risk resulting from the contamination of feed or water.

3.2.1.1.2 Pest Control

- A properly designed pest control program should be used to reduce the potential that pests could serve as vectors for pathogenic organisms.

3.2.1.1.3 Agricultural and veterinary chemicals

- Procurement, storage and delivery of agricultural and veterinary chemicals should be undertaken in such a way that they do not pose a risk of contaminating product or the environment.
- Use of agricultural and veterinary chemicals should be in accordance with the manufacturer's instructions.
- The impact of spray drift or local ground sprays of agricultural chemicals should be monitored and managed. It is also important to communicate with adjacent farms so that information is shared that will allow an adequate assessment of the impact of spray drift.
- Agricultural and veterinary chemical residues should not exceed limits established by the Codex Alimentarius Commission or in legislation.
- Producers should keep records of agricultural and veterinary chemical applications. Records should include information on the date of application, the chemical used, the concentration, method and frequency of application, and where it was applied.

3.2.1.2 Egg laying systems

⁴ Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards in Foods, FAO Headquarters, Rome, Italy 30 April – 4 May 2001, page 14.

⁵ Commercial Chicken Production Manual, 3rd edition, AVI, Chapter 37, Diseases of the Chicken.

- Egg laying establishments should be located, designed and, where appropriate, constructed to minimize, so far as possible, exposure of domesticated birds or their eggs to hazards and pests.
- Systems, including those used to provide food, water, shelter, control predators and manage interactions between birds, should be designed to minimize the risk of transfer of human pathogens⁵.
- The internal design and layout of housing should permit compliance with good hygienic practices.
- Facilities used to house flocks should be cleaned and disinfected in a way that reduces the risk of transfer of human pathogens.
- Use of litter should be managed to reduce the risk of introducing or spreading hazards.
- Water used for facilities and equipment in areas where eggs are handled should be potable, or at least of a quality that does not introduce hazards to human health.
- Cleaning and disinfection programs should be in place, and their efficacy should be periodically verified by scientifically acceptable methods. Such programs should include procedures for cleaning and sanitizing poultry houses, disposing of contaminated litter, and, when necessary, safe disposal of eggs from flocks still in production, specifically diverting eggs to a process that ensures elimination of a hazard.
- A management plan should be in place to detect any failure in cleaning and disinfection programs and ensure that corrective actions are taken.

3.2.1.3 Egg collection

Whether manual or automated methods are used to collect eggs, producers should minimize the time between egg laying and further handling or processing.

3.2.1.3.1 Egg handling

- Methods used to handle eggs should minimize damage to the shell, and avoid contamination.
- Hygienic practices should be used, especially to protect the egg from surface moisture, to exclude damaged and/or dirty eggs from the table egg trade, and to minimize microbial growth through recognition of time-temperature issues in distribution.
- Where appropriate, damaged and/or dirty eggs should be segregated from clean and intact eggs.
- Damaged and/or dirty eggs should be directed to a processing or packing establishment as soon as possible.

3.2.1.3.2 Egg collection equipment

⁵ although evaluation of the importance of such interventions for reducing the risk of human illness based on existing data was inconclusive Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards in Foods, FAO Headquarters, Rome, Italy 30 April – 4 May 2001, page 17

Collection equipment should be made of materials that are non-toxic and be designed and constructed to facilitate good hygiene practice.

3.3 HANDLING, STORAGE AND TRANSPORT OF EGGS

Eggs should be handled, stored and transported within the egg laying establishment, in a manner that minimizes damage, and with appropriate attention to time-temperature considerations.

3.4 CLEANING, MAINTENANCE, AND PERSONNEL HYGIENE AT PRIMARY PRODUCTION

Provisions in this section are equally relevant for small egg producers and/or those using simple equipment.

3.4.1 Personal Hygiene

- Personnel should be in good health and be adequately trained to handle eggs and domesticated birds to ensure the use of good hygienic practices that will minimize the risk of egg or flock contamination.
- Facilities should be available to ensure that an appropriate degree of personal hygiene can be maintained. Such facilities should:
 - Be located in close proximity to wherever eggs or domesticated birds are handled.
 - Be of appropriate design to ensure hygienic removal of wastes and avoid contamination of facilities, equipment, feed or water sources.
 - Have adequate means for hygienically washing and drying hands.
 - Be maintained under sanitary conditions and good repair at all times.
- People known, or suspected, to be suffering from, or to be a carrier of a disease or illness likely to be transmitted to hens or through eggs should not be allowed to enter any hen facility or egg collection or handling area, if there is a likelihood of their contaminating the hens or the eggs. Any person so affected should immediately report illness or symptoms of illness to the management.
- Agricultural workers who have direct contact with eggs should maintain a high degree of personal cleanliness and, where appropriate, wear suitable protective clothing and footwear.
- Personnel should wash their hands when handling eggs or materials that come in contact with them. Personnel should wash their hands before starting work involving the handling of eggs, each time they return to handling areas after a break, immediately after using the toilet, and after handling any contaminated materials where this could result in cross-contamination of eggs.

3.4.1.1 Bird Handlers

- Workers should know and follow preventive measures specific to the premises where they handle birds so as to prevent introducing hazards from other facilities.
- Where personnel look after multiple flocks or livestock of any other kind, suitable precautions should be taken to avoid cross contamination. Where appropriate these may

include washing hands and using clean protective clothing and boots used only for a single flock.

3.4.1.2 Egg Handlers

- Workers should know and follow preventive measures specific to the premises where they handle eggs so as to prevent introducing hazards from other facilities.
- Workers are expected to handle eggs as a food product, and wash their hands before having direct contact with eggs, especially after using sanitary facilities or as necessary when their hands become soiled (e.g., through contact with damaged or dirty eggs).

SECTION IV - ESTABLISHMENT: DESIGN AND FACILITIES

No specific requirements beyond those made in Section 4 of the *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)) are needed.

SECTION V - CONTROL OF OPERATION

These guidelines are supplemental to those set forth in Section 5 of the *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)).

5.1 CONTROL OF FOOD HAZARDS

Measures should be in place to identify eggs containing food safety hazards and manage the risk, such as processing those with microbial hazards at egg product facilities. Standards should be in place to ensure the removal of eggs that are not suitable for human consumption. Controlling outgrowth of pathogens throughout handling and distribution channels, and egg handler education on proper storage and handling methods are the risk management approaches used to minimize the risks associated with eggs during packing and egg products processing. A variety of control measures may be used, provided that an appropriate level of public health protection is obtained and scientifically validated. A risk-based approach should be used to establish performance parameters for product outcomes.

5.2 KEY ASPECTS OF HYGIENE CONTROL SYSTEMS

5.2.1 Time and temperature control

Proper consideration should be given to time and temperature conditions, because time and temperature combinations are critical to food safety. Eggs and egg products should be stored under conditions that will minimize the risk of human illness by minimizing the potential for microbial, chemical, or physical contamination, and by minimizing the outgrowth of microbial pathogens⁶. Storage and handling conditions should be used that will avoid condensation of water on the shell surface.

⁶ Storage of eggs at 10°C (<50°F) or limiting storage at ambient temperatures such that shelf life at retail will not exceed 7 days both are projected to comparably reduce risk of human illness, with the actual reduction dependant on the prevalence of SE within flocks and other variables. Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards in Foods, FAO Headquarters, Rome, Italy 30 April – 4 May 2001, page 14.

5.2.2 *Specific process steps*

5.2.2.1 Eggs

5.2.2.1.1 Cleaning

Eggs should be visibly clean prior to packing, because the contamination may be associated with the presence of human pathogens. An alternative to using a cleaning process to remove visible contamination from the shell surface is to sort eggs.

- If washing is undertaken it may be followed by effective sanitization of the shell, and where appropriate with subsequent oiling of the shell using a suitable food grade oil. Eggs should not be submersed or soaked prior to or during washing. If cleaning compounds are used, they must be suitable for use on eggs.
- If dry cleaning is undertaken, the methods used should minimize damage to the protective cuticle and where appropriate be followed by oiling of the shell using a suitable food grade oil.

5.2.2.1.2 Sorting

- Damaged or dirty eggs should be segregated from clean and intact eggs, for example by candling.
- Damaged or dirty eggs may be directed to processing or be disposed of in a safe manner.
- Dirty eggs may go for cleaning.

5.2.2.1.3 Treatment

Eggs can be treated to eliminate pathogens without affecting their functional properties using for example irradiation or in-shell pasteurization.

5.2.2.1.4 Packing

Eggs should be handled during packing in a manner that avoids damage and contamination.

5.2.2.1.5 Storing

- Eggs should be handled during storing in a manner that avoids damage and contamination.
- Eggs should be stored under conditions that will minimize the risk of human illness by minimizing the potential for microbial, chemical, or physical contamination, and by minimizing the outgrowth of microbial pathogens⁷.
- Storage conditions should minimize moisture on the shell surface.

⁷ Storage of eggs at 10°C (<50°F) or limiting storage at ambient temperatures such that shelf life at retail will not exceed 7 days both are projected to comparably reduce risk of human illness, with the actual reduction dependant on the prevalence of SE within flocks and other variables. Joint FAO/WHO Expert Consultation on Risk Assessment of Microbiological Hazards in Foods, FAO Headquarters, Rome, Italy 30 April – 4 May 2001, page 14.

5.2.2.1.6 Damaged eggs

The above mentioned activities may result in damage to eggs. Damaged eggs should be segregated and sent for processing or disposed of in a safe manner.

5.2.2.1.7 Distribution

- Eggs should be handled during distribution in a manner that avoids damage and contamination.
- Eggs should be distributed under conditions that will minimize the risk of human illness by minimizing the potential for microbial, chemical, or physical contamination, and by minimizing the outgrowth of microbial pathogens.

5.2.2.2 Egg Products

5.2.2.2.1 Cleaning

Refer to 5.2.2.1.1

5.2.2.2.2 Sorting

Refer to 5.2.2.1.2. but these provisions should only be applied to eggs that have intact membranes.

5.2.2.2.3 Breaking

- Separating the egg contents from the shell whether by hand or by machine should be done in a manner that will minimise cross-contamination between the shell and the egg contents, or from personnel.
- Hygienic procedures should also minimise contamination of subsequent egg contents by contaminated equipment after an unacceptable egg has been broken.

5.2.2.2.4 Pulping/crushing

- Removal of unacceptable eggs prior to pulping/crushing is necessary because the resulting egg contents will be commingled.
- Where eggs for pulping/crushing are cleaned, they should be pulped/crushed as soon as possible after cleaning. Pulped/crushed eggs should be processed immediately using a process designed to ensure food safety.

5.2.2.2.5 Processing

5.2.2.2.5.1 Formulation

[Drafting Note: This sections needs to be developed to cover issues of formulation affecting treatment processes.]

5.2.2.2.5.2 Treatment

[Drafting Note: This sections needs to be developed to cover a broader description of treatments and importance of the time/temperature relationship.]

5.2.2.2.5.2.1 Pasteurisation

- Pasteurize liquid egg products, rapidly cool and maintain under refrigeration; use hygienic manufacturing and personnel practices to manage the risk of contamination from food contact surfaces, equipment, and food handlers.
- Time and temperature end point combinations must be used that are adequate to eliminate microbial pathogens based on the pathogen load in the unpasteurized raw liquid eggs presented for processing.
- Dried egg products: pasteurize egg liquid before drying.

5.2.2.2.5.2.2 Product specific treatments

- Dried Egg: pasteurize egg liquid before drying or, for egg albumen, use peroxidase-catalase treatment and/or an appropriate heat treatment (e.g., “hot-boxing”) to destroy pathogens using validated procedures that have a demonstrated capacity to destroy pathogens of concern, especially *Salmonella*; ensure that no cross-contamination of processed materials with raw egg occurs.

5.2.2.2.5.2.3 Blending

[Drafting Note: This sections needs to be developed.]

5.2.2.2.6 Packing

Eggs should be handled during packing in a manner that avoids damage and contamination.

5.2.2.2.7 Storing

Refer to Section 5.2.2.1.5

5.2.2.2.8 Distribution

Refer to Section 5.2.2.1.7

5.2.4 Microbiological and other specifications

Refer to the general principles of food hygiene (*Principles for the Establishment and Application of Microbiological Criteria for Foods* (CAC/GL 21-1997)). Information that may be useful for establishing specifications could include:

- Flock health (including pathogen status);
- Pathogen load in/on eggs;
- Agricultural and veterinary chemical status;
- Age of eggs;
- Handling methods.

5.3 INCOMING MATERIAL REQUIREMENTS

Unsound or unsuitable materials may include:

- Incubator eggs;
- Broken eggs;
- Eggs with bacterial or fungal rots;
- Eggs that may have been adversely affected by exposure to environmental contamination.

5.4 PACKAGING

Packaging for egg products that are considered ready-to-eat should prevent cross-contamination.

5.5 WATER

Refer to the *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)).

[Drafting Note: There may be issues on re-used water that need to be addressed here.]

SECTION VI - ESTABLISHMENT: MAINTENANCE AND SANITATION

These guidelines are supplemental to those set forth in Section 5 of the *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)).

6.2 CLEANING PROGRAMMES

Handling, packaging, and processing eggs use a variety of equipment with sensitive electronic controls. Because wet cleaning may damage equipment, and for much of the electronic equipment there is no intentional contact with egg contents, extended cleaning programs, where appropriate, may be used. Such programs should have procedures to address contamination of product contact surfaces by unintentional breakage of shell eggs. These procedures include removing eggs from the process flow that are likely to break and contaminate equipment.

SECTION VII - ESTABLISHMENT: PERSONAL HYGIENE

No specific requirements beyond those made in Section 7 of the *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)).

SECTION VIII - TRANSPORTATION

These guidelines are supplemental to those set forth in Section 8 of the *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)).

8.1 GENERAL

Transport should be such as to reduce risk of human illness⁹. Transportation conditions should be used that will minimise moisture on the shell surface.

⁹ Transportation should be adequately climate controlled to provide a storage temperature either at 10°C (<50°F) or ensure limiting transportation time at ambient temperatures such that shelf life at retail will not exceed 7 days. Both

8.1.1 Egg haulers

Egg haulers (driver or individual in charge of transport to packing facility) are responsible for providing suitable vehicles for transporting eggs. Vehicles should be built in a manner that will minimize damage to eggs and avoid access by pests. They should be made of materials that permit easy and thorough cleaning. Transport vehicles should not be used for the transport of hazardous substances.

8.1.2 Behavior when transferring eggs

Eggs must be handled in a manner that prevents breakage, be transferred promptly to a hygienic vehicle, and be delivered promptly to the packing facility in order to minimize the time at ambient temperature. If not delivered promptly, they should be maintained under refrigeration throughout transfer. Storage and handling conditions should be used that will avoid condensation of water on the shell surface.

SECTION IX – PRODUCT INFORMATION AND CONSUMER AWARENESS

These guidelines are supplemental to those set forth in Section 9 *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)).

9.1 LOT IDENTIFICATION

Where appropriate, lot records of processing, production and distribution should be kept long enough to facilitate traceback of eggs to the egg laying establishment and egg products to the processing establishment. This period could be much longer than the shelf life of eggs and egg products. Documentation can enhance the credibility and effectiveness of the food safety control system especially when it includes traceback procedures. Labeling and record keeping is also necessary to implement other emergency actions and corrective programs. It is important to ensure that all parties involved in the traceback procedures are adequately aware of and trained in its implementation.

SECTION X - TRAINING

No specific requirements beyond those made in Section 10 *Recommended International Code of Practice: General Principles of Food Hygiene* (CAC/RCP 1-1969, Rev. 3 (1997)).