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GUIDELINE TO FACILITATE INTRA-REGIONAL TRADE IN THE CARIBBEAN

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REGIONAL GUIDELINES FOR
SANITARY MEASURES

GUIDELINE TO FACILITATE INTRA-REGIONAL TRADE IN FRESH EGGS

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REGIONAL TRADE IN FRESH EGGS

ADOPTION

This guideline was adopted by the Council of Trade and Economic Development (COTED) in June 2022.

APPLICATION

These SPS compliant guidelines may be used in providing the conditions necessary to allow for trade of fresh eggs within the region. These guidelines are intended for use by exporters and importers while assisting in the development of the national production systems for trade.
Within these guidelines the term "fresh eggs" may be defined as eggs for human consumption.

BACKGROUND/INTRODUCTION

To ensure SPS compliancy, conditions from the farm to the table must be taken into consideration. This includes conditions in which the layers are housed and raised; the conditions in which the eggs are collected and stored; the conditions in which the eggs are transported.

Product testing will also be considered, testing assesses the performance of an export registered establishment's food safety management system (approved arrangement) in producing SPS compliant eggs. A regular program of product testing provides the importing governments with a level of assurance, which allows the exporting country to issue records (eg: Export Health Certificate) showing that the eggs are free of contaminants..

SCOPE

This guideline applies to fresh eggs and are in compliance with the SPS Agreement and the OIE is considered the standard setting body.

The importation of animal products involves a certain level of disease risk to the importing country. This risk may be represented by one or several diseases, infections or infestations. Therefore, the importing country may wish to perform their own risk analysis. According to OIE, the principal aim of an import risk analysis is to provide importing countries with an objective and defensible method of assessing the disease risks associated with the importation of animal products.

The risk analysis should be transparent, meaning the comprehensive documentation and communication of all data, information, assumptions, methods, results, discussion and conclusions used in the risk analysis. This is necessary so that the exporting country and all interested parties are provided with clear reasons for the imposition of import conditions or refusal to import. The components of risk analysis are hazard identification, risk assessment, risk management and risk communication.

An importing country may decide to permit the importation using the appropriate sanitary standards recommended in the OIE Terrestrial Animal Health Code, therefore, eliminating the need for a risk assessment. These guidelines provide details as to the appropriate standards

recommended within the OIE Terrestrial Animal Health Code with respect to the production of fresh eggs.

PROCESS

1. Application: For fresh eggs to be imported from Country X, an application must be made to the Veterinary Authority of the importing country by the importer:
    - The general public, importers and custom brokers can apply for the permit.
    - The process to apply for an import permit varies from country to country but some common methods of application are via online government websites, via completion of government issued forms, via email, in person etc.
2. Import Risk Analysis (see Appendix): The Veterinary Authority of the importing country may carry out a risk analysis of egg production, collection, storage and transportation within the exporting country (Country X)
3. If the Eggs are produced, collected, stored and transported according to OIE Standards, then risk should be low. Elements of these standards may be found under the section "MANAGEMENT OF FRESH EGGS FROM FARM TO TABLE"
4. If testing for salmonella and other contaminants are done regularly at various points in the production process, these results should be easily accessed by the Veterinary Authority in the importing country, then the risk of importing may be considered low.
5. Import Permit: If risk is low an Import Permit may be issued
   NB: With respect to eggs for human consumption the risk of transmission of disease is usually very low. The main contaminant of concern is salmonella. Therefore, some importing countries may request an Official Sanitary Certificate detailing the methods taken to reduce the levels of salmonella. Additionally, a veterinary inspection of the fresh eggs may be conducted once the fresh eggs have landed in the importing country. This inspection is carried out by the Veterinary Authority and is done to determine if the eggs are fit for human consumption.

CONTENTS

This section includes details as to the appropriate standards recommended within the OIE Terrestrial Animal Health Code with respect to the production of fresh eggs.

MANAGEMENT OF FRESH EGGS FROM FARM TO TABLE

Biosecurity Procedures in Poultry Production (Chap 6.5 OIE-Terrestrial Animal Health Code)

Biosecurity procedures should be implemented with the objective of preventing the introduction and dissemination of infectious agents in the poultry production chain. Biosecurity will be enhanced with the adoption and implementation of the principles of Good Agricultural Practices and the Hazard Analysis Critical Control Point (HACCP) system.

General Biosecurity Requirements

- All establishments should have a written biosecurity plan. Personnel working within the establishments should have access to basic training in biosecurity relevant to poultry production and understand the implications to animal health, human health and food safety.
- There should be good communication between personnel involved in the poultry production chain to ensure that steps are taken to minimise the introduction and dissemination of infectious agents.
- Traceability at all levels of the poultry production chain should be possible.
- Records should be maintained on an individual flock basis and include data on bird health, production, medications, vaccination, mortality and surveillance. Records should be maintained on cleaning and disinfection of farm buildings and equipment. Records should be readily available for inspection on site.
- Monitoring of poultry health on the establishment should be under the supervision of a veterinarian.
- To avoid the development of antimicrobial resistance, antimicrobial agents should be used in accordance with relevant directions of the Veterinary Services and manufacturer's instructions.
- Establishments should be free from unwanted vegetation and debris that could attract or harbour pests.
- Procedures for the prevention of entry of wild birds into poultry houses and buildings, and the control of vermin such as rodents and arthropods should be implemented.
- Access to the establishment should be controlled to ensure only authorised persons and vehicles enter the site.
- All personnel and visitors entering an establishment should follow a biosecurity procedure.
    - The preferred procedure is for visitors and personnel entering the establishment to shower and change into clean clothes and footwear provided by the establishment. Where this is not practical, clean outer garments (coveralls or overalls, head covering and footwear) should be provided. If clean boots cannot be provided, a boot spray may be used or a properly maintained disinfectant footbath. The disinfectant solution in the footbath should be changed on a regular basis to ensure its efficacy, in accordance with the manufacturer's instructions.
    - All personnel and visitors entering a poultry house should wash their hands with soap and water or sanitize them using a disinfectant.
    - Entry of visitors and vehicles should be registered by the establishment.
    - **Personnel who have direct contact with eggs should maintain a high degree of personal cleanliness and, where appropriate, wear suitable protective clothing, footwear and head covering that is not likely to introduce contamination into egg laying areas.**
    - Personnel should wash their hands before starting work that involves the handling of eggs, each time they return to handling areas after a break, immediately after using the toilet, and after handling anything which may contaminate eggs.
- Personnel and visitors should not have had recent contact with other poultry, poultry waste, or poultry processing plant(s). This time period should be based on the level of risk of transmission of infectious agents. This will depend on the poultry production purpose, biosecurity procedures and infection status.

- Any vehicle entering an establishment should be cleaned and disinfected in accordance with a biosecurity plan. Delivery vehicles should be cleaned, and disinfected before loading each consignment of eggs or poultry.
- The establishment should be surrounded by a security fence to prevent the entry of unwanted animals and people.
- A sign indicating restricted entry should be posted at the entrance to the establishment.

Housing Establishments

Areas and Establishments for Egg Laying Systems **(3.1 -** Codex Alimentarius Code of Hygienic Practice for Eggs and Egg Products)

Egg laying areas and establishments should, to the extent practicable, be located, designed, constructed, maintained and used in a manner that minimizes exposure of domesticated birds or their eggs to hazards and pests.
The following should be considered:

- A suitably isolated geographical location is recommended. Factors to consider include the location of other poultry and livestock establishments, wild bird concentrations and the distance from roads used to transport poultry.
- Poultry houses should be designed and constructed (preferably of smooth impervious materials) so that cleaning and disinfection can be carried out effectively and in a way that reduces the risk of transfer of pathogens to the next flock. Ideally, the area immediately surrounding the poultry houses and hatcheries should be paved with concrete or other impervious material to facilitate cleaning and disinfection.
- The internal design and layout of housing should not adversely affect the health of the birds and should permit compliance with good hygienic practices.
- Establishments should be designed to house a single species and a single production type. The design should also consider the 'all-in all-out' single age group principle. If this is not feasible, the establishment should be designed so that each flock can be managed as a separate epidemiological unit.
- Cleaning and disinfection programs should be in place, and their efficacy should be periodically verified and an environmental monitoring program implemented where possible and practicable. These programs should include procedures for routine cleaning while birds are in the poultry house. Full cleaning and disinfection programmes should be applied when poultry houses are empty.
    - De-populated poultry house cleaning procedures should cover cleaning and/or sanitising nest boxes/cages, poultry houses, disposing of contaminated litter, nesting materials and faeces from diseased birds and, where necessary, safe disposal of eggs from infected flocks and dead or diseased birds.
    - The egg-laying establishment should be safe for the re-entry of new stock.
    - Use of litter should be managed to reduce the risk of introducing or spreading hazards.
    - The litter in the poultry house should be kept dry and in good condition.

- The drinking water supply to poultry houses should be potable in accordance with the World Health Organization or to the relevant national standard, and microbiological quality should be monitored if there is any reason to suspect contamination. Water delivery systems should be protected, maintained and cleaned, as appropriate, to prevent microbial contamination of water.
- Drainage systems and systems for storing and removal of manure should be designed, constructed and maintained to prevent the likelihood of contaminating the water supply or eggs.

Access to egg laying establishments by other animal species (i.e. dogs, cat, wild animals and other birds) that may adversely affect the safety of the eggs should be minimized.

The egg laying establishments should, as far as practicable, be kept clean. Accumulations of broken eggs, manure, or any other objectionable materials should be minimized in order to reduce the likelihood of contact with eggs and to minimize attracting pests into the establishment.

Poultry houses, and buildings used to store feed, eggs or other material, should be constructed and maintained to prevent the entry of wild birds, rodents and arthropods.

Primary Production

Egg producers should take all reasonable measures to reduce the likelihood of hazards occurring in or on eggs during primary production.

Primary production activities can significantly impact on the safety of eggs and egg products. **Bacterial contamination of eggs can occur during formation**, therefore the practices used at this phase of production are a key factor in reducing the potential for microorganisms to be present in or on eggs.

It is recognised that microbiological hazards can be introduced both from the primary production environment and from the breeding and laying flocks themselves. Pathogens such as *Salmonella enteritidis* (SE) can be transmitted vertically from breeder flocks to commercial laying flocks, and horizontally from other layers, feed and/or environment and hence to eggs. It is important to note that presence of salmonella in the laying and/or breeding flock increases the possibility of salmonella in the egg.

Therefore, the preventative role of good hygienic and agricultural practice in the primary production of eggs is critically important. Appropriate animal husbandry practices should be respected, and care should be taken to assure that proper health of the breeding and laying flocks is maintained. Further, lack of good agricultural, animal feeding and veterinary practices and inadequate general hygiene by personnel and equipment during egg handling, and/or collection may lead to unacceptable levels of bacterial and other contamination (such as physical and chemical) during primary production.

The focus for primary producers is to reduce the likelihood that such hazards will occur during the primary production phase of the chain. Likewise, in certain primary production situations, the occurrence of food safety hazards may be less avoidable which may result in the application of more stringent control measures during subsequent processing in order to ensure safety and suitability of the finished product. The degree to which primary

production practices control the likelihood of occurrence of a food safety hazard in or on eggs will have an impact on the nature of controls needed during the subsequent processing of eggs.

Contamination of eggs during primary production should be minimized.

Producers should obtain domesticated birds from breeding stock that have been subject to control measures to reduce and, where possible eliminate, the risk of introducing into laying flocks, poultry diseases and pathogenic organisms transmissible to humans.

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. However, in backyard poultry farms and small-scale producers, the number of birds maintained is very small and, accordingly, the systems and hygienic conditions of production may vary. 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 the table egg market, eggs strictly for breaking) and production methods used.

The microbial load of eggs should be as low as achievable, using good egg production practices, considering the requirements for subsequent processing. Measures should be implemented at the primary production level to reduce the initial load of pathogenic microorganisms affecting safety and suitability as much as possible. Such measures would permit the application of microbiological control measures of lesser stringency and still ensure product safety and suitability.

Flock Management and Animal Health

Eggs should come from flocks (both breeding and laying) in good health so that flock health does not adversely affect the safety and suitability of the eggs.

Good animal husbandry practices should be used to help maintain flock health and resistance to colonization by pathogenic organisms. These practices should include timely treatment for parasites, minimizing stress through proper management of human access and environmental conditions and use of appropriate preventive measures for example, veterinary medicines and vaccines.

The *Salmonella enteritidis* Risk Assessment has shown that reducing the prevalence of *Salmonella enteritidis* infected flocks is anticipated to result in a reduction in the risk of human illness from the consumption of *Salmonella enteritidis* positive eggs.

Flock management is critical in reducing the risk of human illness from the consumption of eggs. Good husbandry practices should also be used to reduce the likelihood of pathogens (i.e. avian disease) and thus reduce the use of veterinary drugs. Where drug treatment occurs, its use should be appropriate and should consider possible antimicrobial resistance. In particular, measures to prevent disease could include:

- Evaluating the health status of domesticated birds relative to avian diseases and where practicable, colonization by pathogenic organisms transmissible to humans, and continually taking action to ensure only healthy birds are used.
- Taking preventive measures, including managing human access, to reduce the risk of transferring micro-organisms that may impact on food safety to, from, or between flocks.
- Using, where permitted, appropriate vaccines as part of an overall flock management program, including as measures when introducing new birds.
- Regularly checking the flock and removing dead and diseased birds, isolating sick birds, and investigating suspicious or unknown causes of illness or death to prevent further cases.
- Disposing of dead birds in a manner that prevents recycling of diseases to the laying flock by either pests or handlers.
- Treating birds only with veterinary drugs where permitted, prescribed by a veterinarian and in a manner that will not adversely impact on the safety and suitability of eggs, including adhering to the withdrawal period specified by the manufacturer or veterinarian.
    - Only those medicinal products and medicinal premixes that have been authorized by the relevant authority for inclusion in animal feed should be used.
    - Where birds/flocks have been treated with veterinary drugs that can be transferred to eggs, their eggs should be discarded until the withholding period for that particular veterinary drug has been achieved. Established maximum residue levels (MRLs), including those established by Codex, for residues of veterinary drugs in eggs, may be used to verify such measures.
    - The veterinarian and/or the producer/layer establishment owner/manager or the collection center should keep a record of the products used, including the quantity, the date of administration, the identity of the flock and withdrawal period.
    - Appropriate sampling schemes and testing protocols should be used to verify the effectiveness of on-farm controls of veterinary drug use and in meeting established MRLs.
    - Veterinary drugs should be stored appropriately and according to manufacturer's instructions.
- Particularly for countries where *Salmonella enteritidis* has been associated with poultry or eggs, monitoring for SE through faecal testing and the use of a vaccination protocol may reduce the risk of human illness. If a vaccine is used, it should be approved by the competent authority. Monitoring for SE can also include environmental testing of litter, dust, ventilation fans etc.
- It is crucial to dispose of eggs from infected flocks still in production that represent a risk to human or flock health, in a safe manner or specifically diverting them to a process that ensures elimination of a hazard.
- Where practicable, destruction of *Salmonella enteridis* positive flocks or slaughter in accordance with country requirements is allowed.

Ensuring visitors, where necessary, wear appropriate protective clothing, footwear and head covering to reduce the risk of introducing hazards or spreading hazards between flocks. Visitor movement should be controlled to minimize likelihood of transfer of pathogens from other sources.

Watering

Water should be managed in a way that minimizes the potential for the transmission of hazards, directly or indirectly, into or on the egg.

Water used in primary production operations should be suitable for its intended purpose and should not contribute to the introduction of microbiological or chemical hazards into or on eggs. Water used in primary production should be potable in accordance with the World Health Organization or to the relevant national standard, and microbiological quality should be monitored if there is any reason to suspect contamination.

Contaminated water may contaminate feed, equipment or laying birds leading to the potential introduction of hazards in or on eggs.

As water can be a source of contamination, treatment of drinking water to reduce or eliminate pathogens including *Salmonella* should be considered.

- Potable water should be used. If potable water is not available for some or all purposes, water should be of a quality that does not introduce hazards to humans consuming the eggs. Access to surface water, where it introduces hazards, should be denied.
- Potential sources of contamination of water from chemical runoff or improperly managed faeces should be identified and controlled to the extent practicable to minimize the likelihood of contaminating eggs.
- Appropriate safety and suitability criteria that meet the intended outcomes should be established for any water used in egg production.
- Where practicable, good purchasing practices for water could be used to minimize the risk associated with hazards in the water and may include using vendor assurances or contractual agreements.
- Where possible, water should be regularly tested to ensure that water supplied to the birds is of a quality that does not introduce hazards in or on the egg.
- Water recirculated or recycled for reuse should be treated and maintained in such a condition that no risk to the safety and suitability of eggs results from its use.
- Reconditioning of water for reuse and use of reclaimed, recirculated and recycled water should be managed in accordance with HACCP principles.

Feeding

Feed for the laying and/or breeding flock should not introduce, directly or indirectly, microbiological or chemical contaminants into eggs that present an unacceptable health risk to the consumer or adversely affect the suitability of eggs and egg products.

The improper procurement, manufacturing and handling of animal feed may result in the introduction of pathogens and spoilage organisms to the breeding and laying flock and the introduction of chemical hazards, such as pesticide residues and other contaminants, which can affect the safety and suitability of eggs and egg products.

Producers should take care where appropriate, during production, transportation, preparation, processing, procurement, storage, and delivery of feed to reduce the likelihood of introducing hazards into the production system.

- To minimize the risk associated with hazards in the feed, good purchasing practices for feed and feed ingredients should be employed. This may include using vendor assurances, contractual agreements and/or purchasing batches of feed that have had microbiological and chemical analysis and are accompanied by certificates of analysis.
- Feed should be managed so that it does not become mouldy or contaminated from waste including faeces.
- Feed should be stored in a manner to prevent access by wild birds and rodents. Spilled feed should be cleaned up immediately to remove attractants for wild birds and rodents. The movement of feed between flocks should be avoided.
- As feed can be a source of contamination, heat or other treatment of feed to reduce or eliminate pathogens including Salmonella should be considered.
    - Heat treated feed with or without the addition of other bactericidal or bacteriostatic treatments, such as addition of organic acids, are recommended. Where heat treatment is not possible, the use of bacteriostatic or bactericidal treatments is recommended.
- When the egg producer processes their own feed, information should be kept about its composition, the origin of the ingredients, relevant processing parameters and where practicable, the results of any analyses of the finished feed.
- The owner should keep a record of relevant information concerning feed.

Pest Control

Pests should be controlled using a properly designed pest control program as they are recognized as vectors for pathogenic organisms.

Any pest control measures should not result in unacceptable levels of residues, such as pesticides, in or on eggs.

Pests such as insects and rodents are known vectors for the introduction of human and animal pathogens into the production environment. Improper application of chemicals used to control these pests may introduce chemical hazards into the production environment.

A properly designed pest control program should be used, that considers the following:

- Before pesticides or rodenticides are used, all efforts should be made to minimize the presence of insects, rats and mice and reduce or remove places which could harbour pests.
- As cages/pens/enclosures/coops (if used) attract such pests, measures such as proper design, construction and maintenance of buildings (if applicable), effective cleaning procedures and removal of faecal waste should be used to minimize pests.

- Mice, rats and wild birds are attracted to stored feed. Any feed stores should be located, designed, constructed and maintained to be inaccessible to pests. Feed should be kept in pest proof containers.
- Bait should always be placed in "bait stations" so that they are obvious, cannot be accessed by animals or insects they are not intended for and can be identifiable and easily found for checking.
- If it is necessary to resort to chemical pest control measures, the chemicals should be approved for use in food premises and used in accordance with the manufacturer's instructions.
- Any pest control chemicals should be stored in a safe manner that will not contaminate the laying environment. They should not be stored in wet areas, close to feed stores or be accessible by birds. It is preferable to use solid baits, wherever possible**.**

Agricultural and Veterinary Chemicals

Procurement, transport, storage and use of agricultural and veterinary chemicals should be undertaken in such a way that they do not pose a risk of contaminating the eggs, flock or the egg-laying establishment.

- Transport, storage and use of agricultural and veterinary chemicals should be in accordance with the manufacturer's instructions.
- Storage and use of agricultural and veterinary chemicals on the egg laying establishment should be evaluated and managed, as they may represent a direct or indirect hazard for the eggs and flock.
- Agricultural and veterinary chemical residues should not exceed limits established by the Codex Alimentarius Commission or as per national legislation.
- Workers that apply agricultural and veterinary chemicals should receive training in the proper application procedures.
- Agricultural and veterinary chemicals should be kept in their original containers. Labels should have the name of the chemical substances and the instructions for their application.
- Equipment used to apply or administer agricultural and veterinary chemicals should be stored and disposed of in a manner that does not represent a direct or indirect hazard for the eggs and flock.
- Empty agricultural and veterinary containers should be disposed of according to applicable regulation and/or the manufacturer's directions and should not be used for other purposes.
- 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, the purpose for using the chemical applications and where it was applied.

Collection, Handling, Storage and Transport of Eggs

Eggs should be collected, handled, stored and transported in a manner that minimizes contamination and/or damage to the egg or egg shell, and with appropriate attention to time-temperature considerations, particularly temperature fluctuations.

Appropriate measures should be implemented during disposal of unsafe and unsuitable eggs to protect other eggs from contamination.

Proper collection, whether using manual or automated methods, handling, storage and transport of eggs are important elements of the system of controls necessary to produce safe and suitable eggs and egg products. Contact with unsanitary equipment and foreign materials or methods that cause damage to the shell, may contribute to egg contamination.

- Producers should minimize the time between egg laying and further handling or processing. In particular, the time between egg laying and controlled temperature storage should be minimized.
- Cracked and/or dirty eggs should be excluded from the table egg trade and be directed to a processing or packing establishment, as soon as possible after collection.
- Hygienic practices, which take into account time and temperature factors, should be used to protect the egg from surface moisture in order to minimize microbial growth.
- Broken and/or dirty eggs should be segregated from clean and intact eggs.
- Broken eggs and incubator eggs should not be used for human consumption and be disposed of in a safe manner.

Egg processors should communicate any specific requirements at farm level (i.e. time/temperature controls) to the egg producer.

Eggs from different species of poultry and/or farm production systems (e.g. free range, barn and caged eggs) should be segregated as appropriate.

Egg Collection Equipment *(3.3.1* - Codex Alimentarius Code of Hygienic Practice for Eggs and Egg Products)

Collection equipment should be made of materials that are non-toxic and be designed, constructed, installed, maintained and used in a manner to facilitate good hygiene practices.

It is important to prevent any damage to the eggshells by collecting equipment as such damage can lead to contamination and consequently adversely affects the safety and suitability of eggs and egg products. It is also important that the equipment is maintained to a standard of cleanliness and periodically verified.

Egg collecting equipment and containers should be cleaned and disinfected regularly and replaced when necessary to minimize or prevent contamination of eggs.

Single use containers should not be reused.

Packaging and storage *(3.3.2.* - Codex Alimentarius Code of Hygienic Practice for Eggs and Egg Products)

Egg packaging and packaging equipment should be designed, constructed, maintained and used in a manner that will minimize damage to the eggshell and avoid the introduction of contaminants or growth of existing microorganisms in or on eggs, giving consideration to time and temperature conditions.

Any egg packaging, storage or associated equipment should not transfer substances to eggs that will present a health risk to the consumer.

Where permanent equipment is used, it should be corrosion resistant and easy to clean and disinfect or if necessary able to be dismantled and reassembled.

Storage temperatures, times and humidity should not have a detrimental effect on the safety and suitability of eggs. The time and temperature conditions and humidity for egg storage at the farm should be established considering the hygienic condition of the eggs, the hazards that are reasonably likely to occur, the end use of the eggs, and the intended duration of storage.

Transport, Delivery Procedures and Equipment *(3.3.3.* - Codex Alimentarius Code of Hygienic Practice for Eggs and Egg Products)

Whenever eggs are transported, it should be in a manner that minimizes damage to the egg or eggshell and avoids the introduction of contaminants in or on eggs.

Personnel, vehicular access and delivery procedures should be adequate for the hygienic handling of eggs, such that contamination is not introduced onto the farm and thus in or on eggs.

Lorries, trucks or other vehicles or equipment, which carry the eggs, should be cleaned at a frequency necessary to prevent contamination flow between farms or premises and thus of eggs.

The time and temperature conditions for the transport and delivery of eggs from the producer should be established taking into account the hygienic condition of the eggs, the hazards that are reasonably likely to occur, the end use of the eggs, and the intended duration of storage.

These conditions may be specified in legislation, in codes of practice, or by the processor

receiving the eggs in collaboration with the egg producer and transporter and the relevant authority.

Documentation and Record Keeping

(3.5 - Codex Alimentarius Code of Hygienic Practice for Eggs and Egg Products)
Records should be kept, as necessary and where practicable, to enhance the ability to verify the effectiveness of the control systems. Documentation of procedures can enhance the credibility and effectiveness of the food safety control system.

With respect to food safety, records should be kept on:

- Prevention and control of avian diseases with an impact on public health;
- Identification and movement of birds and eggs;

- Use of agricultural and pest control chemicals;
- Nature and source of feed, feed ingredients and water;
- Use of veterinary drugs/medicines;
- Results of testing;
- Health status of personnel;
- Cleaning and disinfection; and
- Traceability/product tracing and recall.

PATHOGENS GENERALLY ASSOCIATED WITH FRESH EGGS – *SALMONELLA*

Bacteria such as *Salmonella*, *Campylobacte*r, and *Escherichia coli* are among the most common foodborne pathogens that affect millions of people annually – sometimes with severe and fatal outcomes. Examples of foods involved in outbreaks of salmonellosis are eggs, poultry and other products of animal origin. Foodborne cases with *Campylobacter* are mainly caused by raw milk, raw or undercooked poultry and drinking water. *Escherichia coli* is associated with unpasteurised milk, undercooked meat and fresh fruits and vegetables. However parasites (e.g. tapeworms like *Echinococcus* spp, or *Taenia solium*), viruses (e.g. Norovirus infections) and chemical hazards such as veterinary drug residues and chemicals (e.g. dioxins) or environmental pollutants (heavy metals) can also be the source of food borne diseases. With respect to eggs the bacteria of concern is *Salmonella enteritidis*. Details on how to manage and prevent Salmonella outbreaks can be found in the section below. See the OIE website for further information on global initiatives and food safety: OIE Website.

PREVENTION, DETECTION AND CONTROL OF SALMONELLA IN POULTRY (OIE – Terrestrial Animal Health Code – Chapter 6.6)

A pathogen reduction strategy at the farm level is seen as the first step in a continuum that will assist in reducing the presence of foodborne pathogens in eggs. Hygiene and biosecurity procedures to be implemented in poultry farms and hatcheries are essential.

The recommendations presented are relevant to the control of all salmonella with special attention to *S. enteritidis* and *S. typhimurium*, as these are common salmonella serotypes in many countries. It should be noted that the epidemiology of animal and human salmonellosis in a particular locality, district, region or country is important for effective control of Salmonella.

Surveillance of poultry flocks for Salmonella

(Article 6.6.4 – OIE Terrestrial Animal Health Code) Where justified by risk assessment, surveillance should be carried out to identify infected flocks in order to take measures that will reduce the prevalence in poultry and the risk of transmission of Salmonella to humans. Sampling methods, frequency and type of samples required should be determined by the Veterinary Services based on a risk assessment. Microbiological testing is preferred to serological testing because of its higher specificity in layer flocks. In the framework of regulatory programmes for the control of Salmonella in poultry and salmonellosis in humans, confirmatory testing may be required to exclude false positive or negative results.

Prevention and control measures **(Article 6.6.5 – OIE – Terrestrial Animal Health Code)** Salmonella prevention and control may be achieved by adopting Good Agricultural Practices and Hazard Analysis Critical Control Point (HACCP) principles, and other general measures, in combination with the following additional measures. No single measure alone will achieve effective Salmonella control. Additional prevention and control measures include vaccination, competitive exclusion, use of organic acids, culling and product diversion to processing.

Antimicrobial agents should not be used to control infection with Salmonella in poultry, because the effectiveness of the treatment is limited, may mask the infection at sampling, has the potential to produce residues in meat and eggs and can contribute to the development of antimicrobial resistance. Antimicrobial agents may also reduce normal flora in the gut and increase the likelihood of colonisation with Salmonella. In special circumstances antimicrobial agents may be used to salvage birds with high genetic value.

1) Day-old birds used to stock a poultry house and layer flocks should be obtained from breeder flocks and hatcheries that have been monitored in accordance with this chapter and in which no evidence of *S.* Enteritidis and *S.* Typhimurium has been detected.

2) Feed contamination with *Salmonella* is known to be a source of infection for poultry. Therefore, it is recommended to monitor the *Salmonella* status of poultry feed, take corrective measures. Heat treated feed with or without the addition of other bactericidal or bacteriostatic treatments, (e.g. organic acids) are recommended. Where heat treatment is not possible, the use of bacteriostatic or bacteridical treatments is recommended. Feed should be stored in clean closed containers to prevent access by wild birds and rodents. Spilled feed should be cleaned up immediately to remove attractants for wild birds and rodents. Treated feed should be handled and stored in such a way as to avoid recontamination.

3) Competitive exclusion may be used in day-old birds to reduce colonisation by *Salmonella*. Competitive exclusion products should be administered in accordance with the instructions provided by the manufacturer and in accordance with the standards and recommendations of the Veterinary Services.

4) Vaccines are used against *Salmonella* infections caused by different serotypes in various poultry species, including single or combined vaccines. Vaccines produced in accordance with the OIE Terrestrial Animal Health Code should be used.

5) Depending on animal health, risk assessment, and public health policies, culling is an option to manage infected breeder and layer flocks. Infected flocks should be destroyed or slaughtered and processed to minimise human exposure to *Salmonella*. If culling is not applied, eggs for human consumption should be diverted for processing for inactivation of *Salmonella*.

6) *S. enteritidis* is characterised by ovarian transmission. Countries should set targets for eradicating (or significantly reducing) *S. enteritidis* from egg-producing flocks through a

guided policy for eradication from the top of the production pyramid (from grandparent flocks through breeder flocks to layer flocks).

7) The responsible veterinarian should evaluate the results of surveillance testing for Salmonella and supervise the implementation of appropriate control measures. These results should be available to the veterinarian before marketing if a veterinary certificate for flock *Salmonella* status is required. When required by the competent authority, the veterinarian or other person responsible for notification should identify if the presence of Salmonella of the relevant serotype is confirmed.

KEY RELEVANT DOCUMENTS/REFERENCES

All references and sources of information consulted for the development of the guidelines:

Australian Guidelines for Egg Exportation https://www.awe.gov.au/biosecurity-trade/export/controlled-goods/eggs

Codex Alimentarius Code of Hygienic Practice for Eggs and Egg Products (CAC/RCP 15-1976) https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXC%2B15-1976%252FCXP_015e.pdf

EU Guidelines https://unece.org/fileadmin/DAM/trade/agr/promotion/EUEggImports.pdf

OIE Terrestrial Animal Health Code – Sections 1, 2, 5, 6 https://www.oie.int/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmfile=chapitre_bluetongue.htm

APPENDIX – OIE TERRESTRIAL CODE IMPORT RISK ANALYSIS

SECTION 2

CHAPTER 2.1

IMPORT RISK ANALYSIS

Article
2.1.1.

INTRODUCTION

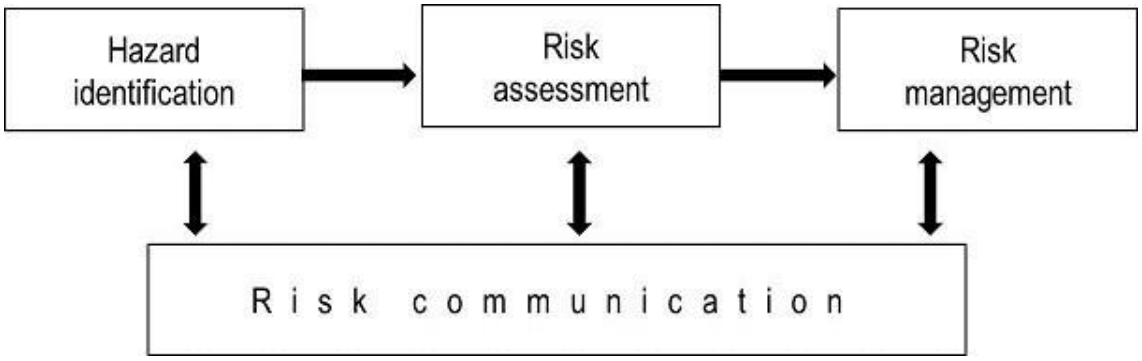
The importation of *animals* and animal products involves a certain level of disease *risk* to the *importing country*. This *risk* may be represented by one or several diseases, *infections* or *infestations*.

The principal aim of import *risk analysis* is to provide *importing countries* with an objective and defensible method of assessing the disease *risks* associated with the importation of *animals*, animal products, animal genetic material, feedstuffs, biological products and *pathological material*. The analysis should be transparent. Transparency means the comprehensive documentation and communication of all data, information, assumptions, methods, results, discussion and conclusions used in the *risk analysis*. This is necessary so that the *exporting country* and all interested parties are provided with clear reasons for the imposition of import conditions or refusal to import.

Transparency is also essential because data are often uncertain or incomplete and, without full documentation, the distinction between facts and the analyst's value judgements may blur.

This chapter provides recommendations and principles for conducting transparent, objective and defensible *risk analyses* for *international trade*. The components of *risk analysis* are *hazard* identification, *risk assessment*, *risk management* and *risk communication* (Figure 1).

Fig. 2. *The four components of risk analysis*



The *risk assessment* is the component of the analysis which estimates the *risks* associated with a *hazard*. *Risk assessments* may be qualitative or quantitative. For many diseases, particularly for those diseases listed in this *Terrestrial Code* where there are well developed internationally agreed standards, there is broad agreement concerning the likely *risks*. In such cases it is more likely that a qualitative assessment is all that is required. Qualitative assessment does not require mathematical modelling skills to carry out and so is often the type of assessment used for routine decision making. No single method of import *risk assessment* has proven applicable in all situations, and different methods may be appropriate in different circumstances.

The process of import *risk analysis* usually needs to take into consideration the results of an evaluation of *Veterinary Services*, zoning, compartmentalisation and *surveillance* systems in place for monitoring of animal health in the *exporting country*. These are described in separate chapters in the *Terrestrial Code*.

Article 2.1.2.

Hazard identification

The *hazard* identification involves identifying the pathogenic agents which could potentially produce adverse consequences associated with the importation of a *commodity*.

The *hazards* identified would be those appropriate to the species being imported, or from which the *commodity* is derived, and which may be present in the *exporting country*. It is then necessary to identify whether each *hazard* is already present in the *importing country*, and whether it is a *notifiable disease* or is subject to control or eradication in that country and to ensure that import measures are not more trade restrictive than those applied within the country.

Hazard identification is a categorisation step, identifying biological agents dichotomously as *hazards* or not. The *risk assessment* may be concluded if *hazard* identification fails to identify *hazards* associated with the importation.

The evaluation of the *Veterinary Services*, *surveillance* and control programmes and zoning and compartmentalisation systems are important inputs for assessing the likelihood of *hazards* being present in the animal population of the *exporting country*.

An *importing country* may decide to permit the importation using the appropriate sanitary standards recommended in the *Terrestrial Code*, thus eliminating the need for a *risk assessment*.

Article 2.1.3.

Principles of risk assessment

1) *Risk assessment* should be flexible to deal with the complexity of real life situations. No single method is applicable in all cases. *Risk assessment* should be able to accommodate the variety of animal *commodities*, the multiple *hazards* that may be identified with an importation and the specificity of each disease, detection and *surveillance* systems, exposure scenarios and types and amounts of data and information.

2) Both *qualitative risk assessment* and *quantitative risk assessment* methods are valid.

3) The *risk assessment* should be based on the best available information that is in accord with current scientific thinking. The assessment should be well-documented and supported with references to the scientific literature and other sources, including expert opinion.

4) Consistency in *risk assessment* methods should be encouraged and transparency is essential in order to ensure fairness and rationality, consistency in decision making and ease of understanding by all the interested parties.

5) *Risk assessments* should document the uncertainties, the assumptions made, and the effect of these on the final *risk* estimate.

6) *Risk* increases with increasing volume of *commodity* imported.

7) The *risk assessment* should be amenable to updating when additional information becomes available.

Article 2.1.4.

Risk assessment steps

1. Entryassessment

   Entry assessment consists of describing the biological pathways necessary for an importation activity to introduce pathogenic agents into a particular environment, and estimating the probability of that complete process occurring, either

qualitatively (in words) or quantitatively (as a numerical estimate). The entry assessment describes the probability of the "entry" of each of the *hazards* (the pathogenic agents) under each specified set of conditions with respect to amounts and timing, and how these might change as a result of various actions, events or measures. Examples of the kind of inputs that may be required in the entry assessment are:

a) Biological factors
   - species, age and breed of *animals*
   - agent predilection sites
   - *vaccination*, testing, treatment and quarantine. b)

Country factors
   - incidence or prevalence
   - evaluation of *Veterinary Services*, *surveillance* and control programmes and zoning and compartmentalisation systems of the *exporting country*.

c) Commodity factors
   - quantity of *commodity* to be imported
   - ease of contamination
   - effect of processing
   - effect of storage and transport.

If the entry assessment demonstrates no significant *risk*, the *risk assessment* does not need to continue.

2. Exposureassessment

Exposure assessment consists of describing the biological pathways necessary for exposure of *animals* and humans in the *importing country* to the *hazards* (in this case the pathogenic agents) from a given *risk* source, and estimating the probability of the exposures occurring, either qualitatively (in words) or quantitatively (as a numerical estimate).

The probability of exposure to the identified *hazards* is estimated for specified exposure conditions with respect to amounts, timing, frequency, duration of exposure, routes of exposure, such as ingestion, inhalation or insect bite, and the number, species and other characteristics of the animal and human populations exposed. Examples of the kind of inputs that may be required in the exposure assessment are:

a) Biological factors
   - properties of the agent. b)

Country factors
   - presence of potential *vectors*
   - human and animal demographics
   - customs and cultural practices
   - geographical and environmental characteristics. c)

Commodity factors
   - quantity of *commodity* to be imported
   - intended use of the imported *animals* or products
   - disposal practices.

If the exposure assessment demonstrates no significant *risk*, the *risk assessment* may conclude at this step.

3. Consequence assessment

Consequence assessment consists of describing the relationship between specified exposures to a biological agent and the consequences of those exposures. A causal process should exist by which exposures produce adverse health or environmental consequences, which may in turn lead to socio-economic consequences. The consequence assessment describes the potential consequences of a given exposure and estimates the probability of them occurring. This estimate may be either qualitative (in words) or quantitative (a numerical estimate). Examples of consequences include:

a) Direct consequences
   - animal *infection*, disease and production losses
   - public health consequences. b)

Indirect consequences

- *surveillance* and control costs
- compensation cost
- potential trade losses
- adverse consequences to the environment.

4. Riskestimation

Risk estimation consists of integrating the results from the entry assessment, exposure assessment, and consequence assessment to produce overall measures of *risks* associated with the *hazards* identified at the outset. Thus *risk* estimation takes into account the whole of the *risk* pathway from *hazard* identified to unwanted outcome.

For a quantitative assessment, the final outputs may include:

- estimated numbers of *herds*, *flocks*, *animals* or people likely to experience health impacts of various degrees of severity over time;
- probability distributions, confidence intervals, and other means for expressing the uncertainties in these estimates;
- portrayal of the variance of all model inputs;
- a sensitivity analysis to rank the inputs as to their contribution to the variance of the *risk* estimation output;
- analysis of the dependence and correlation between model inputs.

Article 2.1.5.

Principles of risk management

1) *Risk management* is the process of deciding upon and implementing measures to address the *risks* identified in the *risk assessment*, whilst at the same time ensuring that negative effects on trade are minimised. The objective is to manage *risk* appropriately to ensure that a balance is achieved between a country's desire to minimise the likelihood or frequency of disease incursions and their consequences and its desire to import *commodities* and fulfil its obligations under *international trade* agreements.

2) The international standards of the OIE are the preferred choice of *sanitary measures* for *risk management*. The application of these *sanitary measures* should be in accordance with the intentions in the standards.

Article 2.1.6.

Risk management components

1) Risk evaluation - the process of comparing the *risk* estimated in the *risk assessment* with the reduction in *risk* expected from the proposed *risk management* measures.

2) Option evaluation - the process of identifying, evaluating the efficacy and feasibility of, and selecting measures to reduce the *risk* associated with an importation. The efficacy is the degree to which an option reduces the likelihood or magnitude of adverse health and economic consequences. Evaluating the efficacy of the options selected is an iterative process that involves their incorporation into the *risk assessment* and then comparing the resulting level of *risk* with that considered acceptable. The evaluation for feasibility normally focuses on technical, operational and economic factors affecting the implementation of the *risk management* options.

3) Implementation - the process of following through with the *risk management* decision and ensuring that the *risk management* measures are in place.

4) Monitoring and review - the ongoing process by which the *risk management* measures are continuously audited to ensure that they are achieving the results intended.

Article 2.1.7.

Principles of risk communication

1) *Risk communication* is the process by which information and opinions regarding *hazards* and *risks* are gathered from potentially affected and interested parties during a *risk analysis*, and by which the results of the *risk assessment* and proposed *risk management* measures are communicated to the decision-makers and interested parties in the *importing*

and *exporting countries*. It is a multidimensional and iterative process and should ideally begin at the start of the *risk analysis* process and continue throughout.

2) A *risk communication* strategy should be put in place at the start of each *risk analysis*.
3) The *communication of the risk* should be an open, interactive, iterative and transparent exchange of information that may continue after the decision on importation.

4) The principal participants in *risk communication* include the authorities in the *exporting country* and other stakeholders such as domestic and foreign industry groups, domestic livestock producers and consumer groups.
5) The assumptions and uncertainty in the model, model inputs and the *risk* estimates of the *risk assessment* should be communicated.
6) Peer review is a component of *risk communication* in order to obtain scientific critique and to ensure that the data, information, methods and assumptions are the best available.

NB: FIRST ADOPTED IN 1998; MOST RECENT UPDATE ADOPTED IN 2018