



Canadian Agri-Food Research Council
Conseil de recherches agro-alimentaires du Canada

Recommended code of practice for the care
and handling of pullets, layers and spent fowl

Poultry - Layers



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Canadian Egg Marketing Agency
1501-112, rue Kent Street
Ottawa, ON
K1P 5P2
Telephone: 613-238-2514
Facsimile: 613-238-1967

For information on the process for the development of a Code, please write to

Canadian Agri-Food Research Council
Heritage House
Building No. 60
Central Experimental Farm
Ottawa, Ontario
K1A 0C6
Telephone: 613-234-2325
Facsimile: 613-234-2330
Internet: www.carc-crac.ca

Also available in French

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Poultry - Layers

Coordinated by

Canadian Agri-Food Research Council (CARC)
CARC Canada Committee on Animals
CARC Expert Committee on Farm Animal Welfare and Behaviour
Canadian Federation of Humane Societies

Review Committee

Participants are listed in Appendix D

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Contents

CONTENTS	i
ACKNOWLEDGEMENTS	iii
PREFACE	v
Codes developed to date	v
Disclaimer	vi
Copyright	vi
READERS' COMMENTS AND SUGGESTIONS	vii
INTRODUCTION	1
SECTION 1 ATTENDANTS and VISITORS	3
SECTION 2 SUPERVISION and PROTECTION	4
2.1 General Considerations	4
2.2 Beak Trimming	5
SECTION 3 RECEIVING NEW BIRDS	6
SECTION 4 HOUSING	7
4.1 Cage Systems	7
4.2 Free-run, Indoor Systems for Commercial Layers	8
4.3 Free-range, Systems with Access to Outdoors	10
SECTION 5 TEMPERATURE, LIGHTING and VENTILATION	10
5.1 Temperature	11
5.2 Lighting	11
5.3 Ventilation	12
SECTION 6 NUTRITION	12
6.1 Water - General	12
6.2 Water - Cage Systems	13
6.3 Water - Free-run, Indoor Systems	14
6.4 Water - Free-range, Systems with Access to Outdoors	14
6.5 Feed - General	14
6.6 Feed - Cage Systems	15
6.7 Feed - Free-run, Indoor Systems	16
6.8 Feed - Free-range, Systems with Access to Outdoors	16
SECTION 7 HANDLING and TRANSPORTATION	17
7.1 General Welfare Considerations	17
7.2 Transport	20
7.3 Emergency Procedures	21
7.4 Receiving and Handling Poultry at Processing Plants	22

7.5	Moving Birds from One Lay Facility to Another	22
7.6	Buildings and Other Facilities	22
7.7	Considerations for Cage Systems	24
7.8	Considerations for Free-run, Indoor Systems	24
7.9	Considerations for Free-range, Systems with Access to Outdoors	25
7.10	On-Farm Slaughter	25
SECTION 8	RESEARCH AND EDUCATION NEEDS	26
TABLE 1	Cage Systems	7
TABLE 2	Free-run, Indoor Systems for Commercial Layers	9
TABLE 3	Water - Cage Systems	13
TABLE 4	Water - Free-run, Indoor Systems	14
TABLE 5	Feed - Cage Systems	15
TABLE 6	Feed - Free-run, Indoor Systems	16
APPENDICES		27
Appendix A	Conversion Factors	28
Appendix B	Glossary	29
Appendix C	Further Reading	30
Appendix D	Participants	32

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Preface

Welfare codes are nationally developed guidelines intended to encourage livestock and poultry producers, handlers, transporters, and processors to adopt the best practices of animal husbandry and handling. They are developed in co-operation with government, the humane movement, veterinarians, animal scientists and industry.

This voluntary code consists of recommended guidelines encouraging producers of eggs for consumption to adopt the best possible husbandry and welfare practices. As such, this code is not a standard.

Guidelines pertaining to hatcheries and breeders are found in the *Recommended code of practice for the care and handling of chicken, turkeys and breeders from hatchery to processing plant*.

Institutions maintaining flocks for research also should be in compliance with the relevant Canadian Council on Animal Care guidelines.

Codes developed to date:

Species	Original	Revision
Poultry	1983	1989
Pullets, Layers, and Spent Fowl	-	2003
Chicken, Turkeys and Breeders		2003
Pigs SEW Addendum	1984 2003	1993 -
Veal Calves	1988	1998
Ranched Mink	1988	-
Ranched Fox	1989	-
Dairy Cattle	1990	-
Beef Cattle	1991	-
Sheep	1995	-
Farmed Deer	1996	-
Horses	1998	-
Bison	2001	-
Transport	2001	-

Further information on the process of Code development and revision can be obtained from the Canadian Agri-Food Research Council (CARC), Heritage House, Building 60, Central Experimental Farm, Ottawa Ontario K1A 0C6. Requests for copies of the Codes can be addressed to the Canadian Food Inspection Agency and/or specific provincial organizations.

The CARC Home Page is www.carc-crac.ca for further information.

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READERS' COMMENTS AND SUGGESTIONS

The Canadian Agri-Food Research Council would like to receive your comments and suggestions on the Recommended Code of Practice for the Care and Handling of Pullets, Layers and Spent Fowl. Please send the completed questionnaire to the Canadian Agri-Food Research Council at Building 60, Central Experimental Farm, Ottawa, Ontario, K1A 0C6, or fax: (613) 234-2330. Feedback will be considered in future editions.

1. My work involves:
 - a) commercial transportation of poultry layers _____
 - b) raising poultry layers _____
 - c) poultry layers care/handling at an auction market _____
 - d) other (please specify) _____

2. The poultry - layers code is relevant or useful in my work.:
 - a) highly _____
 - b) to some degree _____
 - c) not _____

Additional comments:

3. The organization of the code contents:
 - a) is appropriate _____
 - b) needs improvement (please specify) _____

4. The topics contained in the code cover all appropriate aspects of poultry layer care and management:
 - a) yes _____
 - b) no (please specify) _____

Introduction

There is an increasing awareness that currently accepted moral standards for our society call for the prevention of any avoidable suffering. Domestication and selective breeding have made farm animals dependent on humans. Consequently, according to ethical principles, humans must accept this domestication as a commitment for humane conduct toward chickens for their ultimate well being.

This code provides recommendations on the care and handling of chickens raised specifically for the purpose of producing eggs for consumption. It includes recommendations for the following stages:

- following delivery of chicks to the farm premises;
- during the lay cycle;
- during depopulation of the layer barn;
- loading and transportation to a slaughter facility.

All husbandry systems impose restrictions on livestock and poultry, and some of these can cause discomfort or distress by preventing the animals from fulfilling their needs. Meeting these needs includes providing the following:

- comfort and shelter;
- readily accessible fresh water and a diet to maintain full health and vigour;
- opportunity for reasonable movement;
- company of other chickens within the same age range;
- opportunity to exercise most normal patterns of behaviour;
- light of appropriate length and intensity;
- flooring that neither harms the birds nor causes undue stress;
- detection and treatment of abnormal behaviour, disease and parasitism;
- avoidance of predators;
- the adoption of biosecurity measures;
- avoidance of injury;
- emergency arrangements, including alarms, to identify fire, the breakdown of essential mechanical services, intruders and the disruption of supplies; and
- emergency arrangements for transportation accidents.

The recommendations do not claim to be comprehensive for all circumstances, but rather they provide information and guidelines with the view to encouraging operators to examine or improve their own routines. Consideration should be given to the question of animal welfare before installing new equipment or adopting new husbandry systems.

Systems with a high degree of control over the environment should be installed only where conscientious personnel, skilled in both animal husbandry and in the use of the equipment, are readily available. The size or complexity of an operation should not be changed unless the well being of the individual bird can be safeguarded.

It is not acceptable for costs to be a reason to neglect a chicken in obvious distress or for failure to secure prompt and appropriate veterinary or other care, including euthanasia, when necessary.

This code has been prepared with a recognition of current practices. It identifies the areas where the well being of the animals could be at risk unless precautions are taken. The code sets out what these precautions should be, bearing in mind the importance to animals of a total environment and the fact that there is often more than one way in which their welfare can be safeguarded.

The word "must" is used where there is an enforceable statutory requirement and "should" is used to emphasize the importance of a point.

It is recognized that new scientific information or new methods of husbandry may necessitate updating the code.

Section 1 ♦ Attendants and Visitors

- 1.1 Persons working with chickens must understand and accept their responsibility to prevent any form of avoidable suffering. All flock owners should ensure they and their workers have received instruction in and are knowledgeable of the basic needs of the birds entrusted to their care. Attendants should be able to recognize obvious behavioural signs that indicate health problems and discomfort.
- 1.2 To minimize excitement of the birds, attendants working with the same groups of birds should wear clothing of uniform appearance during the whole production cycle. Attendant activities should be consistent and performed according to a schedule. Individuals should talk and move about quietly when working in the barn or with birds. Generally, movement of people and equipment around chickens should be quiet and smooth, especially in loose housing.
- 1.3 Alterations to pens and other housing should be undertaken when no birds are present.
- 1.4 Before entering a loose-housed barn, workers should consistently give the same, easily perceptible signal (such as a distinct number of knocks on the door) to prevent the birds from being startled. This practice is particularly important when the light intensity or noise is greater outside the barn than inside.
- 1.5 All entrances to buildings should be well lit and locked.
- 1.6 No visitors should be allowed onto the premises unless they are in compliance with the farm biosecurity practices. Names and contact information of visitors should be recorded along with the day and time of the visit.
- 1.7 Movement of equipment and personnel between buildings should be minimized, but if it is unavoidable, precautions should be taken to maintain biosecurity.

Section 2 ♦ Supervision and Protection

2.1 General Considerations

- 2.1.1 Flocks should be observed at least twice daily by trained individuals. The physical arrangement of housing should permit easy inspection of all birds.
- 2.1.2 Sick or injured birds must be promptly treated or killed humanely, for example by cervical dislocation. Financial costs should not be a reason for delaying treatment or neglecting injured birds. Dead birds must be removed immediately and disposed of according to provincial environmental regulations and municipal bylaws.
- 2.1.3 Birds should be checked periodically for external and internal parasites. Parasitic infestations should be treated as appropriate. Parasites can be detected by examination of a random sample of birds from various parts of the barn, by attention to behavioural signs that indicate the presence of parasites, by attention to excreta, or by post-mortem examination of chickens suspected of infestation.
- 2.1.4 Where there are clinical signs of disease or abnormal mortality rates, affected birds should be submitted to a veterinarian or diagnostic laboratory for assessment and recommendation for treatment. These recommendations should be followed.
- 2.1.5 An emergency plan in the event of fire or natural disaster for each premise housing pullets and layers should be prepared and every attendant should be familiar with it.
- 2.1.6 Generators should be available as backup in the event of electrical failure to ensure all electrically dependent mechanical systems necessary for bird health and well being continue to operate during a hydro failure.
- 2.1.7 Chickens should be protected from other animals. This protection should prevent both direct and visual contact with animals that cause fear in poultry.
- 2.1.8 Birds should be handled gently to avoid injury. In particular, very young chickens should never be squeezed. Proper attention should be given to prevent them from crowding or piling on top of each other in the corner of pens.

- 2.1.9 The formation of a social hierarchy in layers is associated with aggressive behaviour as individuals compete to establish ranking. Avoid movement of layers from one group to another as much as possible and in large loose flocks, avoid disturbances that result in extensive movement of birds.
- 2.1.10 Precautions should be taken to minimize the presence of wild birds inside and around layer and pullet facilities as they may be carriers of infectious disease. In the event of unusual numbers of dead wild birds, a veterinarian should be consulted and recommendations of the veterinarian followed.
- 2.1.11 Pest control should be a continuing practice using appropriate and humane methods.

2.2 Beak Trimming

Outbreaks of feather pecking and/or cannibalism may occur among layers or older pullets in any type of housing system, representing a significant welfare and production problem. Beak trimming reduces injuries and deaths resulting from such outbreaks. In the future, passive strains of layers may be developed which do not require beak trimming. Farmers will be encouraged to seek out and use these strains. In addition, new beak trimming technologies which enhance bird well being should be adopted.

- 2.2.1 Beak trimming should be carried out only by highly competent, trained individuals. Particular attention must be paid to selection and adjustment of the equipment and to its maintenance.
- 2.2.2 Beak trimming should ideally take place prior to 14 days of age. This recommendation is based on research indicating minimum trauma and rapid recovery when the operation is carried out at or before this age. This must be weighed against practical experience which demonstrates that if trimming is not done properly at this age, a further trim will be required later in life. When correctly done early, beak trimming provides permanent protection from feather pecking damage. Beak trimming is not recommended after eight weeks of age.
- 2.2.3 Approximately two to three days before and two to three days after beak trimming, an electrolyte solution containing vitamins, particularly vitamin K, should be added to the water to facilitate blood clotting, to alleviate stress and reduce dehydration.
- 2.2.4 After trimming, feed and water consumption should be monitored carefully until beaks are healed. Feed levels should be raised and water pressure may have to be lowered or waterers manually triggered for several days following trimming. Follow breeder recommendations for changes in feed to minimize weight loss.

- 2.2.5 Feather pecking can be reduced by increasing feed availability and reducing group size, and with loose flocks, adding litter. The addition of bales of hay is useful for outdoor flocks. A nutritionally balanced diet as well as other good management practices will reduce feather pecking.

Section 3 ♦ Receiving New Birds

- 3.1 Housing facilities should be cleaned, disinfected and prepared to receive the chickens at the time of their arrival.
- 3.2 Heating, ventilation, feed and watering equipment, alarms and generators should be tested to ensure proper functioning. Brooder heaters should be turned on several hours before chick arrival to stabilize temperature and warm the litter and floor areas. Supplementary heat is not required in layer houses provided there are sufficient numbers of birds housed.
- 3.3 Chickens should be carefully removed from the containers they were transported in.
- 3.4 Day-old chicks can be removed by tilting the box slightly and pushing them out carefully or by inclining the box slowly and then withdrawing it from under them with a smooth swift movement. When removed by hand (with the hands forming a scoop) the chicks must not be squeezed. They should not be dropped more than 15 cm (6 in.) on a hard floor or 30 cm (12 in.) on a soft floor. For brooding in cages, chicks should be carefully removed from boxes and placed directly in the cages.
- 3.5 When placing pullets in a loose layer facility, the crate or dolly should be carefully placed on the floor, never dropped and the door opened. Birds that do not leave the crate or cart on their own may be encouraged to leave by tilting the crate or cart slightly or by removing the birds by hand. Care should be taken not to allow crates to slide over each other so as to prevent injury to toes.
- 3.6 When placing in cages, birds may be removed from the crate or dolly by one or two legs or by one leg together with one wing. Cages should be easily accessible and personnel should be able to reach the back of cages.
- 3.7 During all stages of transportation and handling on the farm, pullets should not be subjected to sudden or unusual noise.

Section 4 ♦ Housing

Well being of laying hens depends on proper management of the housing system. Cages are currently the most widely used housing system for laying hens though alternative systems are being adopted. Whatever housing system is utilized, producers should maintain records detailing space allocations provided to the birds, and in this way document that space allocations generally conform to the guidelines of the Code.

4.1 Cage Systems

Pullets and layers raised in cages are provided protection from predators, from the social effects of large groups, and from the extremes of outside environment. A cage environment also provides reliable access to feed and water. Some diseases are easily promoted when birds have access to their own excreta. Cages prevent this and also enhance food safety. Birds in cages seldom require medication.

4.1.1 Space requirements increase as the birds approach their mature weight, and allowance must be made for this. Upon replacement of equipment, the following floor space recommendations apply to egg type birds housed in multiple bird cages (three or more adults).

TABLE 1

Age (weeks)	Maximum body weight (g)	Minimum cage floor space	
		(cm ²)	(sq. in.) ⁵
0 - 6	400 (0.88 lb.)	150	23
6 - 12	950 (2.09 lb.)	270	42
12 - 18/19	1320 (2.91 lb.)	335	52
adult ¹	1700 (3.74 lb.)	432 ⁴	67
adult ²	1900 (4.18 lb.)	483 ³	75

¹typical white-egg layer

²typical brown-egg layer

³same allocation of cm²/g of body weight as⁴

⁴UEP recommendation for 2008

⁵rounded to nearest whole sq. in.

4.1.2 Single bird cages, except in primary breeding, and colony sizes greater than seven layers are not currently recommended. Cage groups of this size can establish and maintain stable internal social hierarchy relatively fast and with a small amount of aversive interaction. Research is rapidly progressing on enhanced cage design with larger colony size.

4.1.3 Cages should be designed to provide the chickens with a safe and comfortable environment. Cage height should permit standing chickens free head movement anywhere in a cage. The cage doors should be designed for easy insertion and removal of chickens. A cage floor that causes injuries or deformities to the hens' toes during any period of the production cycle is unacceptable. Claw shortening devices consisting of abrasive material are beneficial. These are usually installed on the baffle plate behind the feed trough. Cages should be well maintained and in good repair to prevent injury.

4.1.4 Proper building design and accessibility, as well as placement and appropriate use of cages and equipment, are critical for the humane handling of birds. Therefore, owners and managers of a caged-bird operation should ensure that:

- the mature size of the bird strain is considered prior to housing so the strain is suitable for the cage being used. Large birds that weigh 1.9 kg or more when mature (eg. brown birds) should be placed only in cages with large doors. In particular the door size needs to be large enough so birds are housed or removed without injury.
- In addition, cage doors should be large enough to ensure the safe removal of all spent fowl. Cage depth should not exceed 75 cm (30 in.)

4.2 Free-run, Indoor Systems for Commercial Layers

Pullets and layers raised in free-run systems generally have greater freedom of movement than cage-housed pullets and layers. These systems allow for the expression of more of the behaviours normally associated with birds. Perches and nests are easily constructed in free-run housing. As an indoor system, it protects birds from predators and the outside environment.

4.2.1 Barns should be sited on well drained land. The ground-level floor should be made of concrete and be well drained.

4.2.2 Floor space requirements vary considerably depending on breed, ambient temperature and whether any or all of the floor consists of wire or wooden slats. In general, the most space is required in systems with 100% litter floors, and the least where the floor is entirely wire or slats. Producers should interpolate between the extremes in the following table based on individual circumstances.

TABLE 2

Age (weeks)	Maximum body weight (g)	Minimum floor space (cm ²)	
		all litter	all wire/slats
0 - 6	400 (0.88 lb.)	500 (78 in. ²)	250 (39 in. ²)
6 -18/19	1320 (2.90 lb.)	1400 (217 in. ²)	700 (109 in. ²)
adult ¹	1700 (3.74 lb.)	1700 (264 in. ²)	850 (132 in. ²)
adult ²	1900 (4.18 lb.)	1900 (295 in. ²)	950 (147 in. ²)

¹typical white-egg layer

²typical brown-egg layer

- 4.2.3 Aviaries or percheries are variations on the concept of free-run, indoor systems. Because they include one or several levels of perches and/or slatted/wire floors, sometimes with feeding and/or watering appliances, these systems make good use of the cubic space in the barn. Under these circumstances, the minimum floor space allowances in Table 2 will not apply. To avoid aggression among chickens, ensure an adequate number and length of perches are provided. Guidance should be sought from manufacturers and producers familiar with the system in determining stocking density.
- 4.2.4 Caution must be exercised in choosing litter materials to which the pullets or layers have access. Such materials must not contain harmful substances.
- 4.2.5 Litter floors should be checked frequently. If litter becomes caked, wet or excessively dusty, old litter should be replaced.
- 4.2.6 Nests should be easily accessible and should not be so high above the floor level that birds may be injured when ascending or descending.
- 4.2.7 Nest litter, where used, should be changed regularly so it is clean, dry and absorbs moisture readily. Automated nests must be well maintained to avoid floor eggs, especially at the beginning of lay.
- 4.2.8 To avoid aggression, ensure an adequate number of nests is provided. Flocks with inadequate nesting space will lay excessive numbers of eggs on the floor, with a consequent loss of quality, cleanliness and potential value.
- 4.2.9 Nesting space should be provided to accommodate hens without crowding. Twenty individual nests are required for every 100 hens, and allocations of community or roll-away nests should be based on the behaviour and comfort of the birds.

4.3 Free-range, Systems with Access to Outdoors

Pullets and layers raised in free-range systems have greater freedom of movement than other systems. Like free-run systems, free-range housing allows for the expression of more of the behaviours typical of birds. In addition, free-range systems provide birds with access to the outdoors when the climate permits, consequently, exposing these birds to sunlight.

- 4.3.1 Land should be free of poisonous plants, dangerous chemicals and disease-causing organisms that could seriously impair the health of pullets and layers.
- 4.3.2 Flocks should be rotated regularly to prevent a build-up of manure, feathers and other disease-carrying vectors on the land. The frequency of rotation depends on stocking density.
- 4.3.3 Land should be well drained and muddy conditions should be avoided as this may lead to discomfort of the bird and increases the risk of disease.
- 4.3.4 Buildings should have eavestroughs to control and direct water runoff and an overhang with pea gravel or sand or like material just outside the exits/entrances so as to reduce the potential for mud holes. This is particularly important in high rainfall areas.
- 4.3.5 Shelter from sun and adverse weather should be available and all birds should have free and easy access to the shelter. Windbreaks should be provided in exposed areas. Indoor shelter should be provided in inclement weather.
- 4.3.6 Perimeter fencing is required to protect pullets and layers against foxes, cats, dogs and other predators.

Section 5 ♦ Temperature, Lighting and Ventilation

Buildings should be capable of maintaining an adequate microclimate (as related to vapour condensation, dust level, ammonia and carbon dioxide) to reduce the risk of either overheating or chilling of birds. The heating and ventilation systems go hand-in-hand. A change in temperature will change ventilation requirements.

The heating and ventilation systems should be able to maintain the recommended temperature with reasonable accuracy in order to prevent either overheating or chilling of birds.

5.1 Temperature

- 5.1.1 Layers and pullets should be protected against drafts and cold areas. In free-range systems with access to the outdoors, birds must be provided with a shaded area and shelter against adverse weather conditions.
- 5.1.2 Depending on the type of housing used, brooding temperature on the first day of life should range from 28° to 32°C (82° to 90°F) at the eye level of the chicks. Thereafter, the temperature should be lowered by 2-3°C (4-6°F) each week, down to approximately 21°C (70°F) at the age of 6 weeks, and thereafter preferably maintained relatively steady within the range of 10° to 27°C (50° to 80°F). Various strains of chickens can vary in their optimum temperature requirements. For this reason, breeder management guides should be consulted. In addition, the behaviour of chickens in a pen or brooding cage can be used as a reliable indicator of thermal comfort. The crowding of chickens outside the perimeter of the heating zone usually indicates too high a temperature and, conversely, the gathering of chickens in close proximity to the heat source usually indicates too low an environmental temperature. A temperature close to optimal is present when the chickens are evenly distributed throughout the whole brooder area. Other behavioural signs that indicate too high a temperature are panting, frequent spreading of the wings, frequent wing flapping, and pasty excreta on the cloacal area. Signs of low environmental temperature include feather ruffling, rigid posture, trembling, huddling, distress vocalisation, and piling on top of each other.
- 5.1.3 Minimum and maximum inside temperature should be recorded daily.

5.2 Lighting

- 5.2.1 Light intensity should provide adequate illumination for normal feed and water intake and normal activity.
- 5.2.2 Light intensity for the first 3 days of life should not be less than 20 lux (two foot candles) at the eye level of the chicks to encourage them to find and use feed and water. Thereafter, light intensity may be reduced to limit aggressive behaviour, but should also be adequate for birds to eat and drink. Light stimulation begins at the bird's ideal weight, which again varies from strain to strain. Following the guidelines established in the appropriate breeder management guide is important to prevent early sexual maturity and to ensure overall health of the bird through her lifetime.
- 5.2.3 Dimmers may be used to reduce light when the attendant is not present and to increase light to facilitate observation of the birds and the equipment.

5.3 Ventilation

- 5.3.1 The ventilation system should be kept in good mechanical order so it operates according to the specifications of the particular model. It should be cleaned and sanitized regularly.
- 5.3.2 Fresh air should be provided and excessive heat, ammonia and water vapour should be removed by means of efficient air exchange. Ammonia concentrations greater than 25 ppm are not acceptable for human and bird health.
- 5.3.3 Ventilation facilities and equipment should maintain indoor relative humidity below 80 percent at all times and especially at temperatures above 30°C (86°F).
- 5.3.4 During cold weather, incoming air should be mixed with warmer air in the building before it reaches the birds.

Section 6 ♦ Nutrition

Aggressive behaviour may occur when chickens are forced to compete for inadequate resources. To avoid this, make sure layers are provided with enough feeding and watering space and an adequate and predictable supply of feed and water. Feed formulations should reflect the different stage growth of birds and housing system used.

6.1 WATER - General

Water is the birds' most important nutrient. In normal circumstances, potable water should be supplied continuously to birds of all ages. In warm weather, water should be kept cool. Producers should be aware of water growth with regard to mineral and microbiological content. Appropriate water treatments should be initiated to ensure good bird health and proper functioning of equipment.

A variety of watering appliances are used for poultry of different ages. These include nipples, round water dispensers, trigger cups and open troughs. These should be supplied in numbers such that most birds can drink frequently, which will happen in warm weather.

In cages, birds should have access to at least two nipples or cups, in case one of them should break down.

- 6.1.1 When pen temperature is over 26, 28 or 30°C (79, 82, or 86°F), any interruption in water supply should not exceed 12, 6 or 2 hours respectively. The temperature of the drinking water should not exceed 30° C (86°F).
- 6.1.2 Water consumption should be recorded daily and can be easily monitored by the installation of a water meter. Producers should check water equipment daily to make sure it is functioning properly.
- 6.1.3 Water should be tested at least once per year for the presence of coliforms and faecal coliforms.
- 6.1.4 Water requirements depend on age, body weight and ambient temperature. Water consumption of laying birds will double in hot weather (temperatures greater than 30°C - 86°F) compared with moderate temperatures (around 20°C - 68°F). The following suggested waterer and space allowances (Tables 3 - 6) should be regarded as a guide; careful observation of chickens is necessary to ensure birds are drinking an adequate amount of water.

6.2 WATER - Cage Systems

TABLE 3

Age (weeks)	Maximum Body wt. (g)	Birds Per Cup or Nipple
0 - 6	400 (0.88 lb.)	18
6 - 12	950 (2.09 lb.)	8
12 - 18/19	1320 (2.91 lb.)	8
adult ¹	1700 (3.74 lb.)	6-8
adult ²	1900 (4.18 lb.)	6-8

¹typical white-egg layer

²typical brown-egg layer

6.3 WATER - Free-run, Indoor Systems

TABLE 4

Age (weeks)	Maximum Body Weight (g)	Water Trough (cm) ¹	Birds per Nipple or Cup	Birds/Standard Round Waterer
0 - 6	400 (0.88 lb.)	1.5 - 2.0 (0.6 - 0.8 in.)	15 - 20	100 - 150
6 - 12	950 (2.09 lb.)	2.0 - 4.0 (0.8 - 1.6 in.)	10 - 15	75 - 100
12 - 18/19	1320 (2.904 lb.)	3.0 - 4.0 (1.2 - 1.6 in.)	6 - 10	50 - 75
adult ²	1700 (3.74 lb.)	3.0 - 4.0 (1.2 - 1.6 in.)	6 - 10	50 - 75
adult ³	1900 (4.18 lb.)	3.0 - 4.0 (1.2 - 1.6 in.)	6 - 10	50 - 75

¹note that open trough provides access at both sides; a 1 m trough therefore provides 2 m of drinking space

²typical white-egg layer

³typical brown-egg layer

6.4 WATER - Free-range, Systems with Access to Outdoors

6.4.1 Birds should not have access to potentially contaminated water sources.

6.4.2 Water systems like those for free-run, indoor operations should be provided for free-range layers and pullets.

6.4.3 Layers and pullets should not have to travel more than eight metres to reach the water.

6.5 FEED - General

6.5.1 In normal circumstances, all layers and pullets should have access to feed at all times. The diet must not contain ingredients that can cause illness or suffering. The producer must be prepared to replace immediately a diet believed harmful to layers or pullets or to the marketed products. Feed must be protected from contaminants at all times.

6.5.2 Feeding systems should provide uniform feed to all birds. Proper feed depths must be maintained to assure that all nutrients are consumed and the build-up of mouldy feed is prevented.

6.5.3 Feeding equipment should be maintained, kept in good working order and cleaned regularly.

6.5.4 Producers should record feed consumption of birds daily as increases or decreases in consumption can be an early indicator of problems.

6.6 FEED - Cage Systems

6.6.1 Laying birds have access to feed at all times so it is not necessary for all birds to feed simultaneously. In addition, many modern cages have water nipples at the rear of the cage and feed at the front. This results in birds circulating to feed and drink. A minimum of 7 cm. (2.76 in.) of feed trough space per bird is considered adequate.

6.6.2 Feed space in cages depends on age, body weight and other factors. The feeder spaces suggested here are guides only. If growth rates or egg production are below expectation, producers should carefully check that birds are not crowding at the feeders. If such crowding is noted, there may be too many birds for the available space.

TABLE 5

Age (weeks)	Maximum body wt. (g)	Feed trough (cm.)
0 - 3	220 (0.48 lb.)	1.5 - 2.5 (0.6 - 1.0 in.)
3 - 6	400 (0.88 lb.)	2.5 - 4.0 (1.0 - 1.6 in.)
6 - 12	950 (2.09 lb.)	4.0 - 6.0 (1.6 - 2.4 in.)
12 - 18/19	1320 (2.91 lb.)	5.0 - 7.0 (2.0 - 2.8 in.)
adult ¹	1700 (3.74 lb.)	7.0 - 10.0 (2.8 - 3.9 in.)
adult ²	1900 (4.18 lb.)	7.0 - 10.0 (2.8 - 3.9 in.)

¹typical white-egg layer

²typical brown-egg layer

Controlled Moulting

6.6.3 Controlled moulting is not a common practice in Canada. Scientific evidence suggests this practice is stressful for birds. Consequently, controlled moulting by methods involving deprivation of feed is to be phased out by 2005.

6.6.4 Birds in moult and those being prepared for moult should have access to drinking water at all times.

6.7 FEED - Free-run, Indoor Systems

6.7.1 Feed space requirement depends on age, body weight and other factors. The feeder spaces suggested here are guides only. If growth rates or egg production are below expectation, producers should carefully check that birds are not crowding around feeders. If such crowding is noted, there may be too many birds for the available space and more feeders should be added. Note that open troughs provide access at both sides.

TABLE 6

Age (weeks)	Maximum body weight (g)	Feed trough/bird (cm) ¹	Birds per standard round feeder
0 - 6	400 (0.88 lb.)	1.2 - 1.4 (0.5 - 0.6 in.)	40 - 60
6 - 12	950 (2.09 lb.)	2.0 - 2.5 (0.8 - 1.0 in.)	30 - 40
12 - 18/19	1320 (2.91 lb.)	3.0 - 3.5 (1.2 - 1.4 in.)	20 - 30
adult ²	1700 (3.74 lb.)	4.0 - 5.0 (1.6 - 2.0 in.)	20 - 30
adult ³	1900 (4.18 lb.)	4.0 - 5.0 (1.6 - 2.0 in.)	20 - 30

¹note that open trough provides access at both sides. Feeder space available is therefore double the feed trough length shown.

²typical white-egg layer

³typical brown-egg layer

6.7.2 Hens should not have to travel more than eight metres in the house to reach feed and water.

6.8 FEED - Free-range, Systems with Access to Outdoors

6.8.1 Feeding space and diet for free-range birds should be the same as for free-run indoor birds. Appropriate measures need to be taken to protect feed from adverse climatic conditions.

6.8.2 Hens should not have to travel more than eight metres to reach the supplementary feeder.

Section 7 ♦ Handling and Transportation

Animals are subject to inspection under the *Health of Animals Act* transportation regulations while in transit. Successful humane transportation of birds depends upon good co-ordination among all involved parties (including producers). Transportation starts at the time of loading the first bird at the point of origin and ends after it is unloaded at final destination. Confinement time should be as short as possible, consistent with humane handling and treatment.

For spent fowl, the time in transit should be calculated as starting when the first bird is loaded on the truck and when it is unloaded and shackled at the slaughter facility. If transportation time is expected to be longer than 36 hours due to the distance between the layer farm and the processing plant, then humane on-farm slaughter alternatives need to be considered.

As required by the *Meat Inspection Regulations*, each flock transported for slaughter at a federally inspected abattoir must be accompanied by a flock information sheet completed by the producer and transporter.

Spent fowl birds must be handled with special care as they are more fragile than young birds. Though catching and transportation of spent fowl is normally undertaken by a catching crew and a transporter, flock owners bear a responsibility and obligation to ensure catching, transfer on the farm and holding at the farm are completed in such a manner that stress and injury are minimized at all stages.

7.1 General Welfare Considerations

7.1.1 All members of catching and transporting crews should be properly instructed and knowledgeable about the basic aspects of animal welfare and in handling birds. An experienced supervisor should supervise all catching crews. Proper training and evaluation of personnel is the responsibility of the employer. Catching and loading should take place in a timely and efficient manner to prevent suffering.

7.1.2 Producers, crews and transporters need to be familiar with and be guided by the recommendations established in the CARC Transportation Code (2001):

(www.carc-crac.ca/english/codes_of_practice/transport_code.htm)

In addition, crews and transporters must be familiar with and abide by the guidelines, including those for the training of catching crews and drivers, established in the *Recommended Guidelines For*

Procurement, Handling and Transportation of Spent Laying Hens (available from the Canadian Poultry and Egg Processors Council).

- 7.1.3 The producer or representative should be available throughout the catching and loading process.
- 7.1.4 Actual number of birds to be shipped should be confirmed among producer(s), catching crew and transporter before load out commences. In this way, the appropriate number of birds can be loaded so as not to overcrowd the birds. This will avoid problems at the end of loading where, if the numbers are wrong, the loaders may be forced to add extra birds to the crates on the last few rows of the truck. Also, if upon arrival at the farm, it is revealed there will not be a full load on all trucks, personnel can load the trucks evenly and avoid having the last truck partially loaded. This is of greater concern in winter months due to the difficulty in keeping the birds warm while on the truck.
- 7.1.5 Careful catching prevents injury. Injured birds are particularly susceptible to transportation stress. This is inhumane and increases the loss of marketable product.
- 7.1.6 When birds are transported, the design, construction, available space and state of repair of the equipment used should allow the birds to be loaded, conveyed, and removed without injury. Birds should be loaded only into clean transporting containers and vehicles.
- 7.1.7 Transport container door or openings should be large enough to permit easy passage of birds, thus avoiding injury.
- 7.1.8 When loaded into containers, birds must be in an upright position to avoid smothering.
- 7.1.9 The number of birds per container depends on available floor space, body size of birds and prevailing environmental conditions at time of transport. Maximum density should permit all birds to rest on the floor at the same time if they are evenly distributed. Birds should be able to move their heads freely when sitting on the floor.
- 7.1.10 Weather conditions should be considered when determining load densities:
- For spent fowl, the recommended normal maximum density for crates and modules in cold weather is 63 kg/m² (12.9 lb./sq.ft.). This should be reduced by 15 to 20 percent in summer

months and in extreme cold weather (-15°C (5°F) and below), the load density could be increased to 68 - 70 kg/m² (14.0 - 14.3 lb./sq. ft.).

- Point-of-lay pullets should be loaded to a density of 50 to 60 kg/m². These densities will vary with the weight, size of the birds, their physical condition, the climatic conditions and the likely transportation time. In temperatures greater than 30°C (86°F), a reduction of 10 percent should be considered.

- 7.1.11 When loading crates in extreme heat, load the top layer last. This protects the birds from the sun.
- 7.1.12 When loading crates in extreme cold, it is advisable to leave the bottom outside rows empty to reduce possible exposure. Cold air enters the trailer at the bottom, outside area.
- 7.1.13 In extreme heat, keep loaded dollies properly spaced through the barn to take advantage of the shade and ventilation. Care should be taken not to have dollies on the truck for too long while loading or unloading. When dollies are full, load transport and commence driving as soon as possible.
- 7.1.14 When outdoor temperature exceeds 30°C (86°F), additional precautions must be observed to prevent birds being overheated. Loading time should be reduced as much as possible and birds should not be loaded during the most intense heat of the day. The number of birds per container may have to be reduced in order to keep load temperature within the acceptable range.

Extra air movement and shade are valuable at both the loading and unloading sites under these conditions. The vehicle should not be left stationary for more than 45 minutes. If this is not possible, the truck should be kept in shade and an alternative method of air circulation provided. Such methods may include for example, driving the truck a short distance or blowing fans on the birds.

- 7.1.15 Birds should be protected from getting wet, in cold conditions, during loading. Covers on the trucks should be used to protect birds from adverse weather conditions. Extreme changes in temperature should be minimized to the extent possible. During loading they should be protected from sources of heat and steam to minimize the effect of exposure to a sudden drop in temperature. This is a very important consideration in the case of spent fowl as these birds do not have abundant feathering.

- 7.1.16 Containers with birds should be moved, as much as is possible, in a horizontal position. If a conveyor is used for loading or unloading containers of live birds, the conveyor angle should prevent tilting of containers that causes birds to pile up. Containers with chickens should always be moved smoothly and never be thrown or dropped.
- 7.1.17 When containers with live birds are stacked, attention should be paid to temperature, ventilation and spacing. If, during transportation, crates are to be transferred between vehicles, the change in environment should be minimized.
- 7.1.18 Loading of compromised birds such as visibly sick, injured, disabled, or wet birds (in cold weather) or birds with any other condition that further compromises them must be avoided. If load-out is over two or three days, wet birds should be returned to the barn and allowed to dry off before loading the following day. Birds not fit for transport should be killed humanely by the producer. Loading birds not fit for transport is prohibited under the *Health of Animals Regulations*.
- 7.1.19 Feed withdrawal times for spent fowl should be determined in consultation with the processor, respecting Section 138.2(b) of the *Health of Animals Act* transportation regulations. Never withdraw feed to the birds before the agreed upon time. Water should be available to the birds until time of loading. Calcium supplementation should continue with layers until feed is withdrawn to maintain bone strength.

7.2 Transport

- 7.2.1 The driver should check the load and surrounding area for loose birds before departing.
- 7.2.2 The driver of the vehicle is responsible for the care and welfare of all birds during transport. The driver should take into consideration climatic conditions and adjust coverings to allow birds to warm up or cool off, as required.
- 7.2.3 To minimize adverse transportation effects on birds, trucks should proceed immediately after loading, and proper care should be taken during transportation.
- 7.2.4 The air temperature in a load of spent layers should be maintained between 13°C (55°F) and 30°C (86°F). Younger birds may be transported with air temperature in the load maintained between 5°C (42°F) and 30°C (86°F). To keep the temperatures from dropping below these levels during cold

weather, the load may have to be covered with protective material. Development and installation of environmental monitoring devices on live haul trucks should be encouraged to provide drivers with continual information on the load. Drivers should use this information in conjunction with their experience to respond appropriately.

7.3 Emergency Procedures

- 7.3.1 The transporters should have a contingency plan and drivers trained in its implementation. If a loaded transport truck is involved in an accident, the transporters should seek assistance immediately as outlined in 7.3.4.
- 7.3.2 If containers have been spilled and birds are still inside, turn them upright as soon as possible; ensure no heads, wings or legs are protruding from the opening and stack containers by the side of the road away from the vehicle as quickly as possible.
- 7.3.3 Birds may be severely affected by extremes of cold or heat. In cold weather, there will be weather protection in place on poultry trucks. Birds in a disabled truck may suffocate if the weather protection is left in place on a stationary load. The birds must be closely monitored and weather protection should be adjusted if necessary to provide increased ventilation.
- 7.3.4 In the event of an accident involving a poultry transport truck or a roll-over of a poultry transport truck, secure the scene by contacting local police. The load should be pulled upright by a competent wrecker service as soon as it is safe to do so. If experienced handlers are available, rely upon their advice. Poultry shippers should attempt to provide catching crews to the accident site quickly. If a crew is not available, seek assistance from local emergency personnel (e.g. fire fighters). Birds should not be chased or caused to fly. It may be possible to gently, quietly and calmly herd or direct a small group of birds in a specific direction.
- 7.3.5 Severely injured birds should be humanely killed after dealing with the uninjured birds.
- 7.3.6 Transporters should maintain current contact lists of recovery specialists.

7.4 Receiving and Handling Poultry at Processing Plants

7.4.1 Receiving and handling of poultry at processing plants is dealt with in the *Recommended code of practice for the care and handling of chicken, turkeys and breeders from hatchery to processing plant* (2003).

7.5 Moving Birds from One Lay Facility to Another

7.5.1 In the event birds must be moved when in egg production, extra care in handling should be given to avoid internal egg rupture.

7.5.2 Communication of the lighting program should be made to operators of the receiving facility.

7.6 Buildings and Other Facilities

General Considerations:

7.6.1 Owners and operators of poultry operations have a responsibility to provide facilities and equipment that make bird handling, loading and unloading possible without causing injury or suffering. Proper building design and accessibility to transport vehicles greatly improve the humane handling of chickens. The building design should discourage needless transfer of birds between handlers. In cage systems, bump guards or raised platforms may be required for catchers to stand on so birds can be placed or removed with care.

7.6.2 Owners and operators should ensure that there is appropriate access to loading and unloading areas of barns. Any improvement in loading/unloading areas should be considered to minimize loading time and provide protection during loading.

7.6.3 Loading/unloading areas should be designed to permit transport vehicles to turn around, to reach them without having to back in from a public road and to leave them without having to back onto a public road.

- Laneway entrances should be designed to be of sufficient road-top width to accommodate a tractor-trailer - a minimum of 15.2 m (50 ft.) is proposed so the truck does not have to swing across the centre line and into oncoming traffic in order to enter the lane.

- Laneways should be constructed to support the weight and dimensions of the vehicles used to load birds under all weather conditions. A width of 3.7 m (12 ft.) is proposed when tractor-trailers are to be used.
- The travelled portion of the yard and lane should be free of all overhead objects such as branches or wires to a height of 4.5 m (15 ft.) from the surface of the yard and lane.
- Loading/unloading areas should be level and designed to accommodate crates or dolly trailers in an expedient and efficient manner. Loading/unloading should be direct without personnel having to move birds around buildings, trucks or other obstructions. Loading and unloading areas should be designed so the side of the crate trailer abuts the barn entrance and can be moved to allow loading along the full length of the trailer. If this is not possible, alternative methods should be considered.
- Snow should be removed from driveways and loading/unloading areas and, where necessary, products to improve traction should be applied before trucks arrive.
- Lights of appropriate brightness should be provided in all catching, loading and unloading areas. Ideally, lighting should be adjustable to facilitate both position of trucks and loading of the fowl.
- To avoid injury to the birds, it is important to ensure lighting in the barn is adjustable, i.e. dimmer switch or sleeves over light bulbs or the use of coloured bulbs to reduce light intensity and encourage calm among the birds. This is particularly important for handling spent fowl.
- Eavestroughs should be continuous across loading/unloading areas so birds do not get wet if transportation occurs during a rainstorm.

7.6.4 Ventilation should not blow on the trucks that are being loaded and unloaded.

7.6.5 High rise barns' loading areas should not exceed 3.0 m (10 ft.) high to accommodate dolly trailers safely. Failing this, appropriate adjustments that are safe for both birds and personnel should be made (e.g. addition of ground fill).

7.7 Considerations for Cage Systems

- 7.7.1 Barns should be easily accessible at each end of the cage rows.
- 7.7.2 Poultry barns exceeding 50 m (164 ft.) in length should have loading access at each end of the building if the birds must be carried out by hand.
- 7.7.3 Aisles between cages should not be less than 75 cm (30 in.) wide to facilitate unobstructed movement of poultry. There should be at least two metres of space at the end of cage rows.
- 7.7.4 Obstructions (e.g. cross conveyers) should not be installed or placed in such a way as to impede the flow of birds in carts travelling directly into or out of the barn via the proper loading doors. A minimum height of two metres is suggested. Where it is necessary to block the cage rows at the loading end, proper access must be given to the opposite end of the cage row.
- 7.7.5 Cage doors should be of adequate size to remove full grown layers of all breeds without injury.

7.8 Considerations for Free-run, Indoor Systems

- 7.8.1 Piling of birds in corners can cause injury or mortality. Steps, such as rounding the corners of barns with wire mesh, can be taken to prevent this from occurring.
- 7.8.2 Recommended procedures that facilitate easier catching of loose-housed fowl are:
- night time loading
 - lowering the light intensity or using blue bulbs to provide adequate illumination for humans but not for poultry
 - corralling birds with a net or screen at the loading door.
- 7.8.3 The building for free-run flocks should incorporate an outside door for every pen.
- 7.8.4 Installation of specialized equipment such as roosts and nests should be done with full consideration of the need for safe catching.

7.9 Considerations for Free-range, Systems with Access to Outdoors

7.9.1 Birds should be moved inside prior to catching and the considerations for free-run indoor systems apply.

7.10 On-Farm Slaughter

One approach to improving the welfare of spent fowl is reduced handling and transportation time. Humane on-farm disposal of spent hens is encouraged as are ongoing improvements to systems currently in place. As more data from on-farm slaughter become available, such techniques may be used more frequently.

Section 8 ♦ Research and Education Needs

- Poultry truck design for chicken welfare.
- Determine risk factors in transportation and handling of spent fowl.
- Development of a national transportation and handling training program for catchers and drivers, and possibly also producers and processors.
- Examination of on-farm slaughter techniques against humane criteria.
- Humane controlled moulting programs.
- Implications of later (6 to 8 weeks) beak trimming to determine impact, if any, on long-term pain (e.g. phantom, stump pain). This research would emphasize bird behaviour.
- Search for ways to educate small-scale producers about the guidelines in the Code.
- Intensify research on the prevention of osteoporosis.

APPENDICES

Appendix A ♦ Conversion Factors

100 cm² = 15.3 sq. in.

divide cm² by 6.54 to get sq.in.

e.g. 430 cm² = (430 ÷ 6.54) = 65.75 sq. in.

1 cm = 0.39 in.

1 in. = 2.54 cm

1 m = 39.37 in.

1 m = 3.28 ft.

1ft. = 0.3 metres

100 g = 0.22 lb

divide grams by 454 to get lbs.

e.g. 1700 g = (1700 ÷ 454) = 3.74 lbs.

Appendix B ♦ Glossary

In this code the following definitions apply:

Beak trimming:	Practice of removing part(s) of the upper and/or lower beak of chickens to prevent or reduce the vices of feather pecking and/or cannibalism.
Biosecurity:	A combination of management practices designed to limit exposure of poultry flocks to foreign micro-organisms or parasites which are potentially harmful or pathogenic to themselves or to human consumers of eggs or poultry products.
Cage:	Wire or plastic containers used to house various numbers of pullets or layers. Cages for layers have sloping floors to allow eggs to roll out. All cages are equipped with feed troughs and watering appliances.
Chick:	A chicken that is less than 48 hours old.
Chicken:	Member of the species <i>Gallus domesticus</i> .
Container:	Chick box for transport of day-old chicks, or crate or other device for transport of older birds.
Controlled Moulting:	Practice of inducing a flock of layers to cease egg production simultaneously, lose and replace feathers and restore bone integrity. Usually involves restriction of nutrients and reduced day-length.
Dolly:	Wheeled cart used primarily to transport pullets from the growing house to the layer house.
Floor pen:	Part of a house (barn) used to contain pullets or layers in the free-run system. Houses may be divided into pens to limit numbers of birds in a single unit.
Free-range:	Free-run birds which have access to the outdoors, usually a grass pasture.
Free-run:	Birds not restrained in cages, but allowed free use of the floor of the barn.
Hen:	Synonymous with layer. A mature female chicken in active egg production.
Layer:	A mature female chicken in active egg production.
Pullet:	A female chicken older than 48 hours but that has not yet begun to lay eggs and is generally less than 17 weeks old.
Spent Fowl:	Layer that is to be marketed or disposed of following one or more laying cycles.

Appendix C ♦ Further Reading

General Welfare Considerations

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Appendix D ♦ Participants

Representative

Organization

Dr. Jim Chambers	Agriculture and Agri-Food Canada
Peter Clarke	Canadian Egg Marketing Agency
Al Corneil	Canadian Poultry and Egg Processors Council
Bernadette Cox (Secretary)	Canadian Egg Marketing Agency
Brian Dahms	Canadian Poultry and Egg Processors Council
Dr. Jean Dion	Canadian Food Inspection Agency
Dr. Gordon Doonan	Canadian Food Inspection Agency
Dr. Ian J.H. Duncan	Canadian Society of Animal Science
Dr. Gilly Griffin	Canadian Council on Animal Care
Brian Herman	Brian's Poultry Services Ltd. Representing the Catching Sector
Dr. S.K. Ho	Agriculture and Agri-Food Canada
Dr. Bruce Hunter	Canadian Veterinary Medical Association
Dr. Peter Hunton	Canadian Egg Marketing Agency
Dr. Frank J. Hurnik (Chairman)	
Dr. Al Kulenkamp	Shaver Poultry Breeding Farms Ltd.
Robert Law	Shaver Poultry Breeding Farms Ltd.
Penny Lawlis	Ontario Ministry of Agriculture and Food Representing the Provinces
Casey Scherders	D. A. C. Checker Produce Ltd. Representing Poultry Live Haul Transporters
Dr. Gary Thiessen	Canadian Food Inspection Agency
Robert VanTongerloo	Canadian Federation of Humane Societies

Notes

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