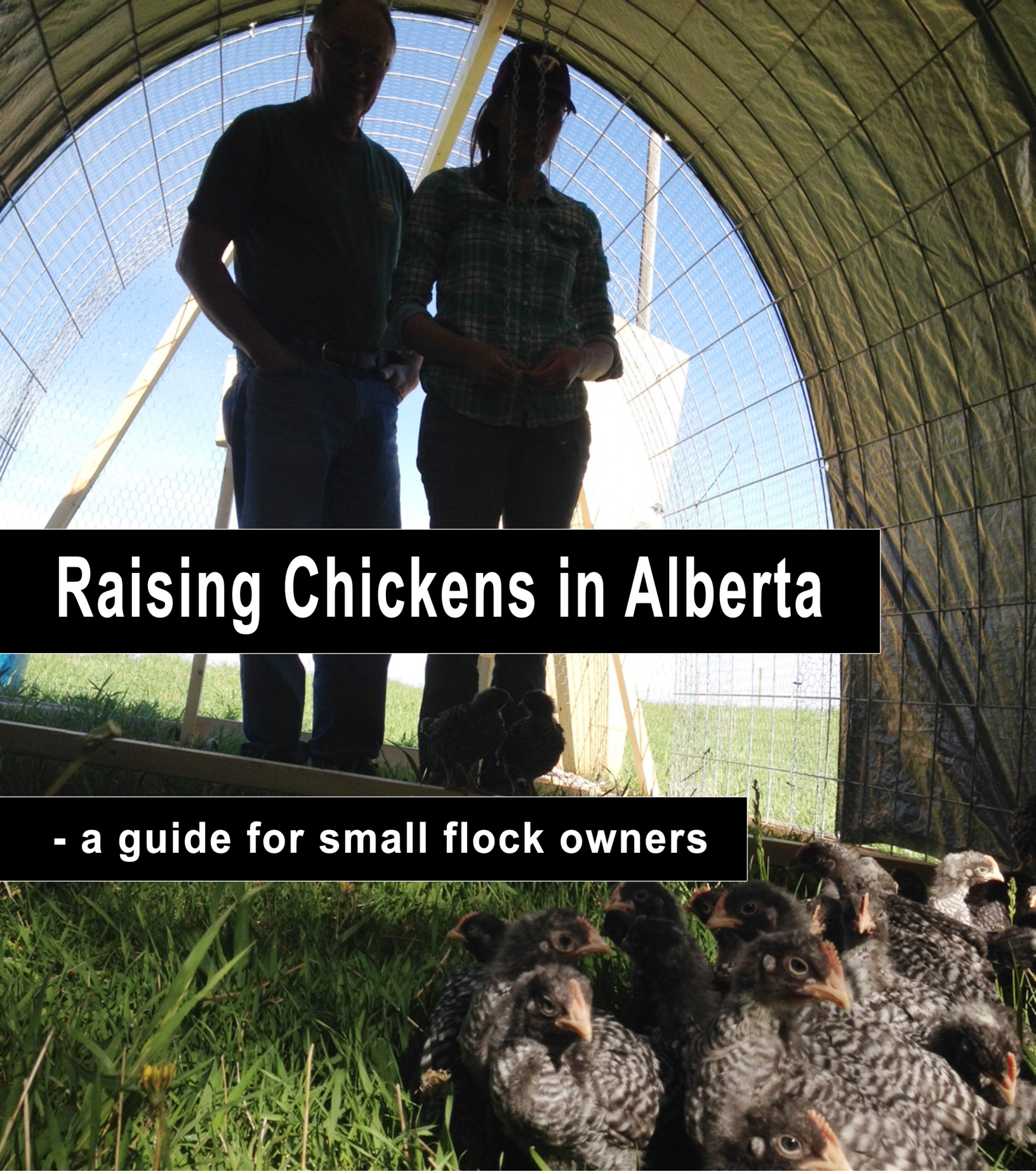

Raising Chickens in Alberta

- a guide for small flock owners

Poultry Research Centre

Alberta Government

For more information on this publication, *Raising Chickens in Alberta,* please contact:

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Introduction

Small poultry flocks provide many benefits to those who keep them. As a small poultry flock owner or potential owner, some of these benefits include:

- Raising food for your own family and others on a small scale
- Knowing the source of your eggs and poultry meat
- Enjoyment from owning and managing a flock.

Objectives of the Workbook

This guide is for small flock, backyard and urban chicken owners. Use this guide as a resource to help you raise your chickens. After you have completed the workbook, you will be able to:

- Determine if regulations allow you to raise chickens in your area
- Meet the basic needs of your chickens including feed, water, light, ventilation and housing
- Identify diseases and inappropriate behaviours of chickens and how to prevent them
- Adjust your management of the flock to address Alberta's extreme weather conditions
- Take steps to keep your flock safe from predators and disease (biosecurity)
- Keep your family safe from disease that can come from live poultry and poultry products.

Workbook Content

The workbook is divided into 10 short modules.

Module 1 Regulations

Before purchasing chickens, you need to be aware of the legislation in your area. Use this module to help you access information on regulations on raising chickens and direct marketing of eggs and meat.

Module 2 Basic Chicken Needs

Chickens have basic needs in terms of feed, water, light, air quality and ventilation. Use this module to help you assess how well you are meeting these basic needs. Information is provided on toxic plants and other foods dangerous for chickens.

Module 3 Chicken House Design and Sanitation

In a climate, such as in Alberta, good chicken house design is critical. Use this module to help you choose a design that suits the needs of your flock. The module also looks at how to sanitize and disinfect the chicken coop to protect both the flock and your family.

Module 4 Egg Management & Meat Processing

If you want quality eggs, you need to follow some sound management practices. Use this module to help you manage light requirements of laying hens, reduce undesirable laying behaviours and properly handle eggs to maintain quality and safety. You also learn how to get birds ready for processing.

Module 5 Appropriate/Inappropriate Behaviours in Chickens

Learn to recognize both appropriate and inappropriate behaviours in chickens and how to prevent undesirable behaviour by correcting any management problems.

Module 6 Care of Chicks

Chicks require special care in order to survive and thrive. Learn how to handle chicks and meet their food, water and temperature requirements. Also learn how to avoid *Salmonella* and prevent common chick problems.

Module 7 Care of Chickens During the Winter

The climate of Alberta can create some challenges to poultry owners. Use this module to help you select breeds suitable for our climate and winterize the coop.

Module 8 Health and Disease of the Flock

The health of a flock can be impacted by environmental factors, management and disease. Learn to recognize and prevent some of the common infectious diseases of chickens in Alberta. Prevention may include vaccination for some diseases.

Module 9 Keep Your Family Safe

Safety for your family includes preventing the spread of disease, following food safety guidelines and wearing personal protective equipment. Use this module to help you avoid food-borne illness from live poultry and poultry products.

Module 10 Safety for Your Chickens (Biosecurity)

Biosecurity refers to practices designed to prevent, reduce and eliminate the introduction and spread of disease. Protection measures also include quarantine, good record keeping, reporting disease when required and dealing with dead chickens and those requiring euthanasia.

References

These provide links to the resources used to write the guide.

Resources

You are provided with a list of resources that provide more information on the topics covered in the workbook.

Glossary

If you come across an unfamiliar term, check the glossary for the definition.

Workbook Evaluation

We welcome your comments and suggestions. Please fill in the online evaluation at:

https://extranet.gov.ab.ca/opinio6//s?s=25579

Icons

When you see this icon, you know that you are provided with an example.

When you see this icon, pick up your pen and start applying the information to your own flock.

This icon highlights key points and reminds you to take action.

Module 1

Regulations

Objectives

After you have completed this module, you will be able to:

- List some key regulations on raising chickens in your community
- Describe the reasons for a Premises Identification (PID) Number
- Access information on regulations on direct marketing of your poultry meat and eggs.

Several regulations impact small poultry owners. This first module introduces you to those regulations.

Local Regulations

Before you purchase any poultry, you need to understand the regulations in your own community. Not every municipality allows you to own chickens. Each municipality has its own set of guidelines and regulations.

Example Local Regulations

The City of Red Deer allows residents to keep some chickens within the city but with many rules and regulations surrounding the bylaw.

It is your responsibility to understand and follow the guidelines for your specific location; each city and county has different livestock regulations.

Your Local Regulations

Find out the regulations in your area. List some of the key points below.

Are chickens allowed?_____

Number of chickens?_____

Types of chickens? _____

Other key restrictions: _____

Local regulations on owning chickens vary a great deal. Know your own regulations. Some municipalities are particular about gender, ages and number of chickens allowed on property.

Premises Identification (PID) Number

Under the *Animal Health Act,* all poultry owners are required by law to apply for a Premises Identification (PID) Account and obtain a PID Number for the premises where the poultry are located. Premises identification is helpful in:

- Tracing animals
- Effectively managing a disease outbreak
- Responding to a natural disaster
- Notifying animal owners in emergencies.

There is no fee to apply; however, you must apply within 30 days of acquiring ownership of an animal (chicken).

To acquire a PID Number, go to: http://www.agriculture.alberta.ca/premises

Direct Marketing of Eggs and Poultry Meat

Federal and provincial laws and regulations serve producers and consumers, protecting their health and livelihoods. If you want to make your poultry products available to the public, familiarize yourself with the regulations on selling eggs and poultry meat, as well as labeling and advertising your product. The regulations specify:

- Types of products that can be produced
- How to label products properly
- Types of farm setups that are best for both producer and consumer.

Farm Setups

There are several different types of farm setups that you can consider to make your poultry product available to the public (see Table 1-1 Types of Farm Setups).

Table 1-1 Types of Farm Setups

Farm Gate	Sell your product directly from your farm
Farm Store	Sell your product from a separate building located on your farm
Community Supported Agriculture (CSA)	Sell your product through a group of shareholders working together to provide for the community

Off-farm Setups

As a poultry producer, you can also sell through “off-farm set-ups”. These off-farm setups include farmers’ markets, shops and restaurants, and online direct orders. Check regulations in your area. When you sell to businesses, shops and restaurants, you may have to meet specific handling and storage criteria. Potential vendors need to check with market managers regarding space availability.

Example Sale of Ungraded Eggs

According to Purchase and Sale of Eggs and Processed Egg Regulation, uninspected and ungraded eggs can be sold directly to consumers if they meet the following criteria:

- Clean with no visible cracks
- Maintained at a temperature of 7°C or less
- The words UNINSPECTED clearly visible on a carton "2 centimetres in height"
- No use of cartons that are already labeled (this is a patented design).

Supply Management System

In Canada, poultry products are controlled by a supply management system. Supply management matches the supply of poultry products to consumer demand. In this system, registered poultry producers acquire quota which allows them to produce poultry meat or eggs over a given time period.

If you choose to operate outside of the quota system, there is a limited number of birds that you are able to produce in a year. This number is set by each governing provincial body. In Alberta, the legislating bodies, Egg Farmers of Alberta and the Alberta Chicken Producers, have legislated specific numbers of chickens you may raise per year if you are operating outside of the quota system (see Table 1-2 Quota Limits in Alberta) and may also control the marketing methods for exempt products.

For more information on the requirements for selling your eggs, go to:

Farm Direct Marketing Eggs: What you need to know. http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex14045

For more information on selling poultry meat at farmers' markets, go to: Farm DIrect Marketing Meats Selling Meat at Alberta Approved Farmers' Markets

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex10326

Contact Egg Farmers of Alberta and the Alberta Chicken Producers to verify regulated exemptions.

Table 1-2 Quota Limits in Alberta

Type	Exempt	Need Quota	Who to Contact for Quota	
Egg	300 or fewer hens/layers in possession	Over 300 hens	Egg Farmers of Alberta	http://eggs.ab.ca/ 403 250-1197
Meat	2000 or fewer meat chickens produced in calendar year	Over 2000 meat birds	Alberta Chicken Producers	http://www.chicken.ab.ca 780 488-2125

Marketing Your Eggs Outside the Quota System

If you choose to operate outside of the quota system, you need to know where you can market your products. In particular, the sale of eggs from a farm without quota needs to be carefully managed.

Marketing Eggs Without Quota

- Eggs from a farm without quota may need to be graded (assessed for interior quality, weight, cleanliness and shell quality) depending on where you want to sell them.
- Eggs sold at farmers' markets and at the farm gate do not need to be graded; however, eggs must be sold to the end customer. A vendor at a farmers' market stall cannot sell to a chef or caterer. If you sell eggs to a commercial establishment such as a restaurant, bakery or hotel, your eggs must be graded by a Canadian Food Inspection Agency (CFIA) registered grading station.

There are two options:

- Obtain your own grading license through the CFIA
- Find a CFIA registered grading station that is licensed by Egg Farmers of Alberta (EFA) to grade third party eggs and contact EFA for an exemption.

Additional Requirements for Raising and Marketing Chickens

Although you may be exempt from license and quota if you produce fewer than 2000 broilers in a year, there are still some residency and marketing requirements. You must live on the land where the broilers are produced and must ensure that no more than the exempted level of chickens is raised on the same parcel of land within the calendar year. In addition, the exempted chicken must be consumed by your family or sold directly to the end consumer from one of three locations:

- Property where the chicken is raised
- Adjacent property to where the chicken is raised
- From a stall at a farmers' market.

Exempted chicken cannot be sold to grocery stores, meat shops or restaurants. If you butcher an animal and process on your own property, you and your family can eat it, but you cannot sell the meat to the public.

Federal Laws

If you want to sell meat or by-products, the Meat Inspection Act requires you to be registered with a federally inspected processing plant.

The Provincial Laws Meat Inspection Act (Alberta) states that you can sell, offer for sale, deliver or transport meat to any person who is not a member of your immediate household if:

- *Poultry is inspected by a veterinarian*
- *Inspection takes place before and after slaughter*
- *Slaughter happens at an abattoir*
- *Carcasses are fit for consumption*
- *Approved meat carries an Alberta Approved Inspection legend.*

See Module 4 Egg Management & Meat Processing.

Conclusion

This module has provided you a basic outline of the types of legislation and regulations that you need to investigate if you have a small flock or are planning to have one. Once you have determined what you can and cannot do in your location, you are ready to move on to Module 2 where you learn some of the basic needs of poultry.

Use the following checklist to assess your understanding of your role in meeting legislation and regulations on raising chickens and selling the eggs and meat.

Checklist

- ❒ I have researched the regulations on raising chickens in my area.
- ❒ I have applied for a Premises Identification (PID) Number.
- ❒ I have researched the legislation and regulations on selling eggs and poultry meat.
- ❒ I have contacted a processing plant to slaughter and process my chickens.
- ❒ I have decided to sell my product in the following ways:

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Module 2

Basic Chicken Needs

Objectives

After you have completed this module, you will be able to:

- Feed different types of chickens according to their specific needs
- Avoid toxic plants and other foods dangerous for chickens
- Provide suitable water sources for your chickens
- Manage light requirements for various types of chickens and provide the required air quality and ventilation.

The first module introduced you to the regulations on raising poultry in your community and selling poultry meat and eggs. This module takes you a step further. You will examine some basic needs of chickens and how these vary depending on the type of chicken raised.

Management of Different Types of Chickens

There are many different types of birds that you may choose to raise. The box below describes the most common.

Types of Chickens

- Egg laying bird, also known as a laying hen
- Meat type bird, also referred to as a broiler
- Dual purpose bird that can lay eggs and be used for a small amount of meat at the end of its cycle.

Each of these birds need to be managed specifically for what they are to produce.

Example Management of Different Types of Chickens

- Laying hens need to be carefully managed for egg production, with light cycles being of critical importance. Broilers, on the other hand, need to be managed differently for meat production with nutrition being critical.
- Dual purpose birds require a balance between laying hen management and broiler management.

A dual purpose bird will not begin to lay until 22 weeks of age. If you are raising your dual purpose bird for meat, it should be slaughtered before it starts laying eggs. If you want to raise your birds for eggs, photostimulate at 20 weeks and they should begin to lay at 22 weeks of age.

For more information on photostimulation, go to page 2-14.

Not all heritage breeds are dual purpose. Some breeds such as the white and brown leghorn are more suited for laying eggs.

Light Sussex

Rhode Island Red

If you are raising chickens on pasture, they also require feed appropriate to their stage of growth.

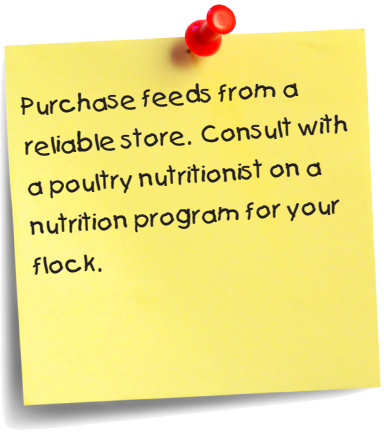
Feeding Needs of Chickens

As chickens grow, their dietary needs change, creating a need to separate their nutrition into phases – promoting the best nutrition in all stages of life for each type of bird. Similar to human development, the metabolism in chickens changes as they grow; the feed must also change to meet the nutritional requirements.

Example **Different Dietary Needs of Chickens**

- Chicks need a diet high in protein and energy to promote a significant amount of muscle development.
- Growers need a diet that develops bones and muscles.
- Finishers need a diet that maintains body weight.
- Layers need calcium for egg development.

During the laying phase, the right energy/protein ratio of the diet is important to keep a steady production and egg size. The increased amount of calcium in this diet plays an important role in the egg's shell quality.



You need to customize what you feed to the type of chicken that you want to produce. Purchase commercial feeds from a reliable feed store to help you find the right feed for your flock. Also, consult with a poultry nutritionist to help you customize a nutrition program to address the specific needs of your flock.

If you are making a custom diet, pay attention to mixing vitamins in the feed properly, as some of it settles to the bottom. Many poultry producers aim for good feed conversion ratio (FCR). FCR is the amount of body mass produced from the amount of food ingested. Factors that may affect FCR can include feed type, health status and husbandry practices.

How Chickens Break Down Food

Chickens break down their food in their gizzard by ingesting grit, which helps to grind the food. Oyster shell is the most common type of soluble grit as it contains calcium which supports egg shell development. If chickens are fed scratch or whole grains, they will need grit to digest these larger particles. If you are feeding commercial mash, crumble or pellets, you will not need additional grit. Chicks should not eat grit until after their first week of life.

Pecking Behaviour

Chickens explore their surroundings by pecking. Although pecking is appropriate behaviour, it can lead to the ingestion of foreign materials. Foreign materials could include bits of plastic from children and pet toys, paint chips and yard decorative materials. An accumulation of such materials can build up in their digestive tract or lodge in their gizzard. This could lead to reduced feed conversion, nutrient deficiency, choking and even death.

Types of Feed Forms

There are three main types of feed forms: mash, crumble and pellet.

Mash (Finely Ground Feed)

Finely ground feed is less expensive than pellets but not as digestible (see Figure 2-1 Chick Mash). Since the ingredients are mixed in a mash form, the particle size is very important for this type of feed. If the particle size is too small, birds will not eat it but, if it is too large, it encourages the birds to pick the bigger particles and leave behind the other components. This may result in birds with nutrient deficiency due to the unbalanced diet.

Figure 2-1 Chick Mash

Crumble (Medium-Sized Feed)

Crumble is made by crumbling pelleted feed (see Figure 2-2 Crumble). It is recommended for baby chicks for the first week or two of life.

Figure 2-2 Crumble

Pellets (Large-Sized Feed)

A pellet is compressed mash. Although pellets are more expensive than mash, the rations are more digestible. During the production of pellets, the mash diet is combined with steam and forced into small holes. This heats up the matter, breaking down carbohydrates and denaturing proteins, making them more available to birds. Since everything is bound together, it ensures the birds eat a balanced diet.

A good pellet must be resistant to breaking. Good pellet diets must be uniform in shape and size and should not contain much broken particles among intact ones (see Figure 2-3 Pellets). This type of feed is recommended for growing and adult birds.

Figure 2-3 Pellets

Special Foods

Grit

Grit consists of crushed limestone and granite. Grit helps the bird's gizzard grind the food. There are different sized grit particles. Chick grit is smaller, to help with easy digestion, and chicken grit is larger. If feeding grit to chicks, wait until after the first week of life and feed them specified chick grit. Grit helps chickens digest larger particle sized grains. You do not have to use grit if feeding commercial crumble or mash.

Scratch

Scratch is a treat consisting of different grains that are of larger particle size. Scratch can be fed to adult chickens if accompanied with grit.

Crushed Oyster Shells

Crushed oyster shells are generally offered free choice for hens that are laying eggs. Crushed oyster shells are an excellent source of calcium which aids in egg shell formation (see Figure 2-4 Crushed Oyster Shells).

Figure 2-4 Crushed Oyster Shells

Figure 2-5 Layer Ration

Feeding Strategies

Each chicken type needs different feeding strategies. If you raise heritage chickens, there can be a variation in how much each type of bird will eat. Heritage chickens generally do not over-eat as they tend to be more active than commercial breeds.

For a laying-type bird, use the feeding schedule in Table 2-1 Feeding Schedule for Laying Chickens.

Table 2-1 Feeding Schedule for Laying Chickens

Age	Feed Type	Purpose
0 – 6 weeks	Starter	High protein and energy content for muscle development
6 – 19 weeks	Grower	Lower protein and same energy content for growth
20 weeks and up	Layer	Lower energy and higher protein and calcium for better egg size and shell quality

For a meat-type bird, use the feeding schedule in Table 2-2 Feeding Schedule for Meat Chickens

Table 2-2 Feeding Schedule for Meat Chickens

Age	Feed Type	Purpose
0 – 6 weeks	Starter	High protein and energy content for muscle development
6 – 13 weeks	Grower	Lower protein and same energy content for growing bird
13 – 20 weeks	Finisher	Lowers the protein level
1 month prior to consumption	Unmedicated Finisher	Prevents medication residue entering meat

Determine the Feed Needs of Your Chickens

If you have a flock or are planning to have one, summarize the types of feed most appropriate for your flock and research where you might find the feed in your community. Consider both the types of feed and the protein, energy and calcium content.

Type of Chicken	Type of Feed Required	Local Feed Store and Location

For further information on how to feed poultry, visit the Manitoba Government's Poultry Rations and Feeding Methods page here:

http://www.gov.mb.ca/agriculture/livestock/production/poultry/poultry-rations-and-feeding-methods.html

Feed and Water Placement

With the heritage breeds, there may be quite a bit of variation in size, so make sure the smallest birds are able to reach food and water.

As chickens grow, adjust the feeder height in order to keep it lined up with the crop (a bit above the dorsal line). If it is too high, it prevents birds from eating and, if it is too low, birds may waste feed and increase the risk of breast and leg injuries as a result of laying down for long periods while eating. The same applies for water, except that the height must be at the head level (this is to stimulate the natural way that chickens drink water by stretching their necks).

Winter Feed Rations and Water Requirements

If you house your chickens over the winter months, make sure your feed supplier can provide your feed throughout the winter. Some feed stores stock their feed for the summer but do not replenish in the winter. If you plan on keeping your birds over the winter, it may be necessary to pre-purchase your feed and store it for use over the winter.

Store feed in mouse-proof containers in a cool, dry place.

During winter months it is important to make sure that feed is available at all times. Particularly in the cold winter months, there is an increase in energy requirement as the chickens try to stay warm. If cold, a chicken will use all its energy to keep itself warm and will not have a good feed conversion ratio. To help your chickens maintain a positive energy balance in winter, add oil to the feed to provide extra energy in the form of excess fat. This can be broken down in the chicken's body to provide the energy needed for keeping warm.

If you are supplying scratch in the winter, provide it at night after the chickens have eaten their complete diet first, allowing them to digest the scratch throughout the night. Since scratch is comprised mainly of carbohydrate, overnight digestion will turn it into easily used sugar and raise the chicken's internal temperature.

Finally, it is important to ensure that your chickens can access water throughout the winter without getting wet. Use nipple drinkers with a heated hose or heated water dishes. The desirable temperature for the water ranges from 10°C to 27°C; if the water is too cold or too warm, birds won't drink it.

If you allow your chickens access to the outdoors during the winter, keep the feed free of snow. Excess moisture can cause feed contamination through mould, which can contribute to health problems in chickens.

Food and Plants to Avoid

This section looks at foods that should not be fed to chickens as well as plants that are toxic to chickens.

Unsuitable Table Food For Chickens

Do not feed food from the table to chickens. Much of it is toxic for chickens as described in Table 2-3 Table Food Toxic or Undesirable for Chickens.

Table 2-3 Table Food Toxic or Undesirable for Chickens

Table Food	Effect on Chickens
Nightshade Family (tomatoes, potatoes, eggplant)	- contain toxic substance called solanine - can cause digestive and neurological problems that damage the digestive system
Salty foods	- can result in salt poisoning from an overabundance of salt
Onions (Spanish, shallot, white, garlic, pearl, red, sweet, ramp, scallion, cipollini)	- contain a toxin called thiosulphate - can destroy red blood cells, cause jaundice, anemia or death - give eggs an off taste
Dried or undercooked beans	- contain a natural chemical called hemagglutinin - disrupt the digestive cycle and cause severe pain - contain phytohemagglutinin and lectin (toxic to chickens and lowers the nutritional value of beans)
Avocado: skin, pit, leaves	- contain the toxin persin - can cause myocardial necrosis
Raw eggs, shell	- encourages chickens to deliberately break and eat their own eggs
Chocolate	- contain toxin called methylxanthines theobromine - is poisonous to chickens
Apple seeds	- contain trace amounts of cyanide - can lead to death

Alberta Wild Plants Toxic to Chickens

If you let your chickens have access to pastures or areas not monitored regularly, be aware of some common wild plants found in Alberta that are toxic to chickens. Check the area to ensure no poisonous plants, either wild or ornamental, are accessible. See Table 2-4 Plants Toxic to Chickens for a list of plants that could potentially poison your flock.

Table 2-4 Plants Toxic to Chickens

Name	Location in Alberta	Why it's toxic	What it looks like
Jimsonweed, Devil's Snare *(Datura stramonium)*	Southern Alberta	Contains toxic tropane alkaloids Reduces weight gain	
Purple Cockle, Corn Cockle, Corncockie *(Agrostemma githago)*	Southern Alberta	Contains toxic saponin githagin which poisons the stomach Symptoms of poisoning include diarrhea, vomiting and shallow breathing	
Black Nightshade, Potato Family (*Solanum americanum)*	Alberta	Contains toxic glycoalkaloids If ingested in large quantities, may end in death	
False Hellebore, Indian Poke *(Veratrum viride)*	Eastern Alberta	Contains steroidal alkaloids which are toxic to poultry	
Death Camas *(Toxicoscordion venenosum)*	Alberta	Contains toxic alkaloids If ingested, can cause incoordination, coma and death	

Henbane, Black Henbane, Stinking Nightshade *(Hyoscyamus niger)*	Alberta	Contains toxic alkaloids If ingested, may end in death	

Water Needs of Chickens

A chicken will normally drink double the amount of food it consumes by weight. Clean and fresh water must always be made available to your chickens. Particularly during extreme weather, summer and winter, take extra care to maintain clean and fresh water.

Types of Waterers

Water can be supplied to chickens in a variety of ways, each with some advantages and disadvantages.

Nipple Drinker

The most common system in poultry barns currently is the nipple drinker (see Figure 2-6). The nipple drinker is supplied by a central water line and allows access to water through multiple nipples along the line. Nipple drinkers provide a clean option for water and are adjustable to chicken height fairly easily. Nipple drinkers commonly come with cups that are fastened underneath the nipple to catch water leaks and drips. This helps prevent wet litter and manure. The biggest problem with nipple drinking lines is that they can be a challenge to properly clean and disinfect.

Figure 2-6 Nipple Drinker

Bell Drinking System

The bell drinking system (see Figure 2-7) is an open water system, allowing for the chickens to have easy access to water; however, it can be contaminated by litter, feed and feces more easily than the nipple drinking system. Additionally, when bumped, the bell drinking system can spill, promoting a high moisture level in the litter.

Figure 2-7 Bell Drinker

High moisture levels in litter and manure can create a number of problems:

- *Higher levels of ammonia, which negatively impacts air quality*
- *Foot health problems*
- *Increased humidity, which can negatively impact flock health.*

Cup Drinking System

Similar to the bell drinker, there is a cup drinking system available for small flocks. The cup system contains a similar water reservoir to the bell drinker; the cup drinker is often fixed to minimize water spillage.

Choose a Watering System

Indicate the pros and cons of each of the watering systems and check the one that might be best suited to your needs.

	Pros	Cons
Nipple Drinker	_____	_____
Bell Drinker	_____	_____
Cup System	_____	_____

Cleaning of Watering Systems

With any systems that have standing water, it is important to establish a routine cleaning system as bacteria grow and illnesses spread more easily in dirty water containers. Fill watering containers that do not automatically fill at least twice daily. Ensure proper cleaning at least once daily, removing any visible contaminants to maintain bird health. You may also want to consider filtering for organic matter, silt and algae, to avoid plugging lines. Flush and clean out water lines at flock change.

If your water source is from a well or rainwater, routinely test the water to ensure it is at quality standards for your chickens. Different substances in your water supply, such as iron, can promote the growth of deadly bacteria. Also, some water sources have a higher saline content, which, when coupled with the salt in a chicken's diet, can dehydrate your chicken.

Check the water's characteristics such as colour, smell and taste as described in Table 2-5 Water Characteristics.

Table 2-5 Water Characteristics

Colour	Meaning	Smell	Meaning	Taste	Meaning
Reddish Brown	Iron	Rotten Eggs	Hydrogen Sulphide	Bitter	Ferrous and Manganese Sulphates
Blue	Copper			Salty	Salt

Calculate Water Needed for Your Flock

To calculate the water necessary for your flock, go to: http://www.agric.gov.ab.ca/app19/calc/livestock/waterreq_dataentry1.jsp

Write down the number of gallons per year that you will need for your flock: _____

To purchase a water testing kit, go to:

https://ca.idexx.com/water/water-testing-solutions.html

Platinum Brooding http://www.platinumbrooding.com/toolsandsensors

Online rural water quality information tool http://www.agric.gov.ab.ca/app84/rwqit

Contact 310-FARM to find a water specialist near you.

Light Needs of Chickens

Two components of light that are important to a healthy flock are duration and intensity. It is crucial to use a lighting program that manages these components. The photoperiod (duration) influences the rate of sexual development including reproductive and egg production cycles. If stimulated too early, growth development problems and risk of prolapse increase. If you use an indoor lighting system, chickens will need specific light intensity to meet their age requirements. If light intensity is too high, it can increase the risk of aggression and possibly cannibalism. If light intensity is too low, it can cause a reduction in food and water intake.

Dual purpose chickens develop slower than modern commercial breeds. Generally, heritage breeds do not begin to lay eggs until 4 weeks later than commercial breeds. You need to make light adjustments if using a commercial chicken lighting program. Chickens should be stimulated (increase photoperiod) at 20 weeks of age. This means you must increase the length of light a half hour each day until the duration reaches 16 hours. By photostimulating birds at 20 weeks, you allow their frame size to mature before they start to lay eggs. If your birds are stimulated at 20 weeks of age, by 22 weeks of age your birds should have begun to lay.

Light (intensity) is measured in lux or foot-candles (10 lux = 1 foot-candle).

To measure light intensity, or lux, use a light meter.

Before you photostimulate your birds, they must be approaching a mature weight and should also be displaying bright red combs and noticeably pinkish/reddish faces. Chickens ready for photostimulation will act flighty and be spooked more easily.

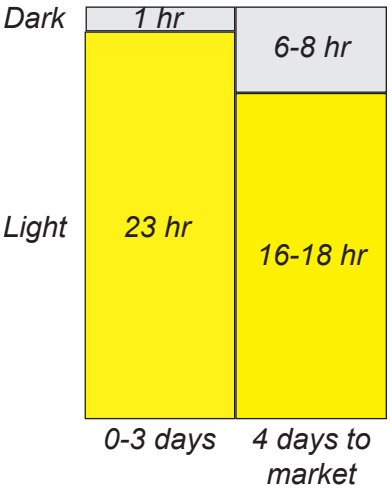
Light Needs of Dual Purpose Chickens

Dual purpose chickens can be raised either for meat or egg production. If your aim is for meat, use a broiler lighting program. If your aim is for eggs, use a broiler breeder lighting program.

Meat Bird (Broiler)

Chicks up to 3 days should have 23 hours of light and 1 hour of darkness. Chicks older than 3 days should be given 16 to 18 hours of light and 6 to 8 hours of darkness until market age (20 weeks) (see Figure 2-8 Light Needs of Meat Birds). Provide 30 to 40 lux on enclosed houses to stimulate chicks to eat during the first days of life.

Figure 2-8 Light Needs of Meat Birds



Egg Bird (Egg Layer)

Chicks up to 3 days old should have 23 hours of light and 1 hour of darkness. After the third day, diminish light one hour per day until it reaches 10 hours. To prevent cannibalism, provide no more than 10 lux in enclosed houses. At 20 weeks of age, increase lighting to half an hour a day until it reaches 14 hours. Keep the duration of daylight constant during the whole production phase. For open houses, increase the amount of light given until it reaches the longest day of the year. Provide a minimum of 30 lux in enclosed houses to avoid floor eggs. If chickens do not have enough light, they will not seek out the nest box to lay their eggs.

Air Quality Needs of Chickens

Air quality consists of several factors including humidity, dust, odour, gas levels, ventilation and temperature. Keep the coop dry and keep the carbon dioxide and ammonia amounts low. Monitor for ammonia, carbon dioxide and humidity.

- Ammonia must be kept below 25 parts per million (ppm)
- Carbon dioxide should be below 3,000 ppm
- Humidity should be between 50 to 60 percent during the brooding stage.

Ventilation Needs of Chickens

Ventilation is required to minimize dust, provide fresh oxygen and decrease the amount of harmful gases. Ventilation needs to change seasonally. In summer, ventilation is needed to remove excess heat. In winter, ventilation is needed to remove ammonia and carbon dioxide. In both summer and winter, you need to manage moisture. The amount of moisture added by the birds must be removed. Some consequences of not removing enough moisture are high ammonia buildup and water-soaked litter. Both increase the chance of illness and disease for your chickens.

There are different ways you can ventilate your coop/barn.

- Natural ventilation uses natural forces such as wind and thermal buoyancy to provide fresh air in your coop/barn. This can include open window, ventilation slot, gable or louvered vents.
- Mechanical ventilation can consist of an electrical fan or wind turbine.

Regardless of the type of ventilation you use, remember to protect any openings that are exposed to the elements. You do not want snow, hail, sleet or rain entering the coop. If the roosts (where chickens sleep/perch) are too close to a ventilation opening, you risk chilling your birds.

Make sure predators cannot get into your coop.

Light Bulbs

For a list of light bulbs used in poultry operations and a comparison of light output and cost variability go to Lighting for Poultry Operations (ARD): http://www.growingforward.alberta.ca/cs/groups/growing_forward2/documents/document/bnqt/mjy0/~edisp/agucmint-264479.pdf

Note: LED lights last longer, provide sufficient amount of light and are also energy cost efficient.

Ammonia test strips are an inexpensive way to monitor ammonia levels and can be purchased from your local farm supply store (e.g., Penner Farm Supplies in Red Deer).

For CO_2, humidity, temperature, light and ammonia readers, see Platinum Brooders selection of meters http://www.platinumbrooding.com/toolsandsensors

Temperature Needs of Chickens

For temperature and humidity measurement tools (infra-red thermometer, rectal thermometer, litter temperature probe), go to: http://www.platinumbrooding.com/toolsandsensors

When you measure temperature, it is important to measure at chicken height and at the highest point the chicks can reach, and also at the coldest time of the night (4 AM). Temperature and humidity go together, and humidity can change the temperature drastically.

To lower the temperature, raise the heat source upwards and measure at chick height. To raise the temperature, lower the heat source closer to the chicks and measure at chick height. When you move the chicks from the brooder into the coop/barn, make sure the pullet/growing chick is fully feathered.

See Table 2-6 Temperature Requirements of Chickens for temperature requirements for chickens of different ages.

Table 2-6 Temperature Requirements of Chickens

Chicks	When first placed in the coop/barn, air temperatures should be approximately 32.2°C (90° F)
Growing Birds	Temperature can be reduced by about 1°C (5° F) per week
Fully Feathered	Once the bird is fully feathered, keep a steady temperature of 21.1° C (70°F)

Victory Farm, an organic egg farm, offers a video on when to move pullets (growing chickens) from the brooder into the coop: http://victoryfarm.org/entry/movingpullets.html

Animal Welfare Needs of Chickens

Animal welfare emphasizes the five freedoms. Poultry should be free from hunger and thirst, discomfort, fear and distress, pain, injury and disease. They should also have the opportunity to express normal behaviours.

Shelter Needs of Chickens

Chickens must be provided with a shelter. The next module looks at the need for shelter, some shelter designs and sanitation and pest control of the coop/barn.

Conclusion

This module has introduced you to some of the basic needs of chickens at different stages of growth. These basic needs include feed, water, light, air quality, ventilation, temperature and housing. You were also introduced to foods and plants that can be toxic to chickens. Because housing is a bigger topic, it is covered in more depth in Module 3.

Use the following checklist to help you assess how well you are meeting the basic needs of your chickens.

Checklist

- ❒ I have done the Exercise on page 2-7 to determine the type of feed I need for my flock.
- ❒ I have done the Exercises on page 2-12 and 2-13 to determine the amount of water I need per year and the type of waterer suitable for my needs.
- ❒ I have checked that my source of water is suitable for chickens.
- ❒ I have determined the light needs of the chickens I raise and the ways to obtain this lighting.
- ❒ I have selected a meter to monitor for ammonia, carbon dioxide, humidity and temperature.

Module 3

Chicken House Design and Sanitation

Objectives

After you have completed this module, you will be able to:

- Choose a design for a chicken house that suits the needs of your flock
- Develop a cleaning routine for your chicken coop
- Take steps to sanitize and disinfect your chicken coop to protect both the flock and people.

The previous module looked at the basic needs of chickens, including feed, water, light, ventilation and air quality. This module continues with a more in-depth look at housing needs of the flock and looks at several different types of chicken house designs and features within these designs. You will be able to select a design that suits your needs and budget. The last part of the module looks at how to clean the chicken coop and the need to sanitize and disinfect it for the protection of your flock and family, as well as control of pests.

Chicken House Design

Shelter serves two purposes:

- Protection from predators
- Protection from environmental conditions.

Predators

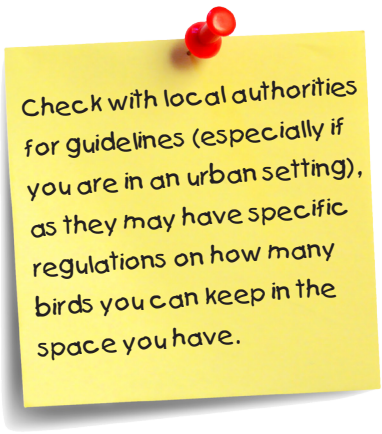
Predators are not limited to but can include jays, crows, eagles, hawks, owls, foxes, rats, skunks, badgers, weasels, ferrets, fishers, martins, minks, lynxes, cougars, coyotes, wolves, black bears, grizzly bears, snakes, dogs and cats.

Environmental Conditions

During the summer months, chickens are more likely to suffer heat stress. In the winter months, chickens are more likely to suffer from illnesses derived from excess moisture, freezing conditions and an increase in ammonia and carbon dioxide.

Position the chicken house to reduce any wind exposure. Place your windows in the coop facing south to catch more light during the winter months. If you want eggs throughout the winter months, provide an artificial light source. Ensure you build a sturdy roof that can withstand the weight of heavy winter snow.

Consider the R-value on insulation to determine what to use; some common materials are polyurethane spray foam insulation, glass wool insulation, fibreglass insulation and reflective insulation. Include a vapour layer so insulation material does not become moist or wet. Chickens will eat insulation if it is not properly covered and hidden (a plastic sheet is not enough protection).



Types of Chicken Coops

There are several different types of chicken coops. One is a stand-alone chicken coop without a run. It gives the birds shelter but no access to a run. If you would like to give your chickens access to the outdoors, you can build a run or a fence. Build the run or fence to separate your chickens from other outdoor wildlife (birds, cats, dogs, coyotes) and prevent chickens from escaping.

Another type of housing is an enclosed coop with access to outdoors as illustrated in Figure 3-1 Two Chicken House Designs with Outdoor Runs.

Figure 3-1 Two Chicken House Designs with Outdoor Runs

A variation on the chicken coop with an outdoor run is illustrated in Figure 3-2 Moveable Coop. With this design you have the ability to move the coop to access new grass.

Figure 3-2 Moveable Coop

For more information on housing designs, go to:

Floor plans from Agriculture Canada: http://publications.gc.ca/collections/Collection/A63-1489-1980E.pdf

Layer house for 300 hens: http://www.cps.gov.on.ca/english/po5000/po5255.htm

Broiler barn: http://www.cps.gov.on.ca/english/plans/E5000/5310/M-5310L.pdf

Additional housing needs: http://www.ag.ndsu.edu/extension-aben/buildingplans/poultry

http://canadianhomesteadsupply.com/cackellac-chicken-tractors/

http://managingwholes.com/poultry-pens.htm

Choose a Housing Design

Spend some time looking at different housing designs and the advantages and disadvantages of each. Try to look at at least three designs that might suit your needs. Keep in mind the need for protection from predators and harsh environmental conditions.

Design	Advantages	Disadvantages	Cost
1.			
2.			
3.			

Coop Necessities

In addition to a shelter, there are some necessary features that should accompany a coop in order for your chickens to carry out their natural behaviours. Coop necessities are listed on the next page.

Roosts and Perching

Make sure you place roosts higher than nest boxes.

Roosts or perches are where the birds sleep. Hens prefer to perch on roosts that are raised. Perches should be at least 16 inches (40 cm) above the adjacent floor. Perches should not be higher than 3 feet (0.9 m) off the ground; any roost higher than that can cause injuries such as bruised feet and egg ruptures. Under the perches allow for at least 12 inches (30 cm) of clearance (see Figure 3-3 Design of the Roost or Perch). Place roosts higher than nest boxes, as chickens will try to seek out the highest perch possible. Ensure that nest boxes are closed during the evening to dissuade chickens from sleeping in nesting areas at night. As birds raised for meat grow larger, generally they do not use a roost but instead will roam on the floor.

Figure 3-3 Design of the Roost or Perch

Nest Boxes

Provide one nest box for every 3 to 4 hens.

Hens prefer nesting boxes that are private, not crowded and comfortably bedded. They will lay eggs in nest boxes that are shaded or in the darker areas of the barn/coop. In a line of nesting boxes, hens tend to congregate to the nest boxes on the ends where they feel more protected. Provide one nest box per 3 to 4 birds. Use wood shavings and chopped straw for nest bedding. Avoid using cedar wood shavings and newspaper.

Floor Litter

Chickens need a dry environment. Provide 2-5 inches (5-12 cm) of absorbent litter material such as wood shavings, straw and chips to reduce the moisture content. See Figure 3-4 Absorbent Litter.

Figure 3-4 Absorbent Litter

Use absorbent litter material to reduce moisture in the pen.

Dust Bath

Chickens will roll around in loose materials such as sand, dirt and mulch. This behaviour helps clean their feathers and remove parasites. See Figure 3-5 Dust Bathing.

Figure 3-5 Dust Bathing

Keeping the Coop Clean

The first step to ensuring a healthy living environment for your birds is to clean the barn/coop. Soiled bedding or litter increases the ammonia and moisture levels in the poultry house. Spilled water, blown-in snow, mud tracked in from the run, fecal matter and dirty feathers can all lead to soiled litter. It is crucial to clear out bedding and wet litter, and replace it with fresh clean bedding and litter. Make sure you clean out the run, nest boxes and the floor.

Some clean up duties should be done daily, whereas others can be done on a monthly or yearly basis.

Due to a large amount of dust, dirt and fecal matter, it is important to take the necessary precautions before cleaning the coop. Safety gear that can be worn includes eye goggles, coveralls, long sleeves, boots, face mask and plastic gloves.

Daily Cleaning Chores

Remove soiled litter from nest boxes. Nest boxes and subsequently eggs can easily become soiled if the chickens are allowed to roost in the nests during the night. Avoid this by closing the nest boxes or have them slightly tilted to discourage hens from remaining in nest boxes over the night. Clean waterers and soiled feeders, and clean up any spilled feed.

Install a Droppings Board

If you install a droppings board underneath the roost, the board will capture the chicken manure. This will make it easier for you to clean up and observe abnormal manure droppings (see Figure 3-6 Droppings Board).This can help you detect malnutrition or disease. Remove fecal matter from the droppings board daily by using a scraper tool. Scrape the fecal matter into a bucket and remove it from the coop.

Figure 3-6 Droppings Board

Deep Bedding Method

One option during the winter months is to use a deep bedding method. This method adds fresh litter over top of old and allows for the litter and manure to compost underneath in order to provide warmth to the chickens. Bedding needs to be of absorbent material such as pine shavings. Turn the litter once a month to avoid caking that can lead to foot injuries.

Sanitation

Effective sanitation (cleaning) between flock placements helps protect the animals in your care as well as the people around you. Sanitizing can lower pest numbers and viral and bacterial infections. Sanitation is also important for ensuring food safety. The birds in your care will benefit from a clean environment.

Take the following steps to ensure effective sanitation.

Six Steps to Effective Sanitation

Step 1	Move all birds out of the coop to a safe location. Remove barn equipment and soak it in sanitizing detergent. Rinse the detergent off with water and let dry in the sun.
Step 2	Remove all organic material such as feathers, carcasses, manure, litter, bedding, food, dust and dirt from the walls, roosts, floors and ceilings. Do not forget to remove the nesting material from the nest boxes and any organic material found in the outdoor run. To remove organic material, use a shovel and broom. Dispose of the material according to municipal regulations.
Step 3	Use a pressured water hose to spray the ceiling, light fixtures, walls and nest boxes. This will remove some of the ingrained dirt, dust and organic matter.
Step 4	Put sanitizing detergent in the soap shooter nozzle and pressure wash the coop.
Step 5	Rinse off the sanitizing detergent with water.
Step 6	Cover the coop with disinfectant.

An example of a probiotic cleaner is Chrisal. A probiotic cleaner minimizes the amount of ammonia in air, eliminates biofilm, and reduces unwanted odours. Any probiotic cleaners used have a lag time for you to "seed the environment". Thus these should not be used as your sole method of cleaning.

Keep the birds out of the coop for the period of time recommended on the disinfectant container.

Always allow for downtime. Downtime is the time between disinfecting the poultry house and filling it with new birds. Allow a minimum of two weeks downtime.

Disinfectants

Disinfectants are strong chemicals that are poison if swallowed or inhaled and are skin and eye irritants. Wear proper gear to protect your eyes and skin, and ensure good ventilation when cleaning. Always read the label for precautions.

Disinfectants use antimicrobial agents to destroy or inactivate microorganisms that may be harmful to your flock. Disinfectants are most effective after a thorough sanitation of your coop is complete. See a list of some common disinfectants in Table 3-1 Some Common Disinfectants.

It is important to read and follow all directions, including how to use, disposal, expiry dates, dilution rates and exposure times. If you are using a product beyond its expiry date, it is less effective.

Table 3-1 Some Common Disinfectants

Product	Description	Effective Against
Proquat	A strong disinfectant that is used to disinfect hatcheries, poultry equipment, floors and walls	It is an effective disinfectant against Herpes simplex virus, influenza A2 and fowl laryngotracheitis.
Virkon	Oxidative disinfectant that kills up to 500 strains of bacteria and fungi	It is effective against exotic Newcastle disease, avian influenza and *Salmonella*.
Profilm	A disinfectant that when mixed with water becomes formaldehyde	It is effective against *Mycoplasma* and *Salmonella*.

Pests

Pests can include anything that may damage property and livestock. Insects, rodents, wild birds and predators all pose risks to your animal feed, chickens, housing units and your own health. Pests can carry disease (such as *Salmonella*), injure and kill birds, as well as contaminate and consume animal feed.

Mice can carry a deadly hantavirus. People who work, live or play near nesting areas of rodents (such as mice) are at risk of contracting the hantavirus. The hantavirus is spread via airborne transmission. This happens when nesting materials, fresh rodent urine or droppings are stirred up and droplets that contain the virus are released into the air. A person is infected when they breathe in air that is contaminated with the hantavirus. This can lead to hantavirus pulmonary syndrome (HPS).

Control rodent pests with traps (see Figure 3-7 Mouse Trap) and poisons.

Figure 3-7 Mouse Trap

Use the following checklist to ensure you control any pests.

Pest Control Checklist

- ❒ If trees are located near the poultry house, remove low hanging branches, clear away fallen leaves and prune branches 3-4 feet (1 m) from the rooftop.
- ❒ Keep barns and coops free of cracks that can let in unwanted visitors such as insects, rodents and birds.
- ❒ Close off any entry points (pipes, cracks in walls and foundation, ventilation slats).
- ❒ Clean up any feed spills or broken eggs promptly. Remove and properly dispose of any dead animals.
- ❒ Remove materials and clutter (plywood, old feed containers and old fencing) from poultry coop/barn to decrease available hiding and nesting areas.
- ❒ Control rodent population with traps and poisons. Any poison or bait stations should be placed outside the area that chickens have access to.
- ❒ Keep perimeter around poultry house 3 feet (1 m) clear and free from tall grass and weeds; rodents feel safe walking through sheltered areas but avoid walking in open, clear space.

Conclusion

You should now have the tools to choose a housing design and coop necessities that fit the needs of your poultry flock. Keep in mind the need for proper sanitation and pest control in order to keep your flock and the people who work around the flock healthy.

In Module 4, you start to look at egg management, including techniques for achieving quality eggs, coop requirements for quality eggs, egg handling and washing and health advice on prolapse. In addition, you will learn about some of the meat processing regulations in Alberta.

Use the following checklist to help you assess what you have done and what you still need to do.

Checklist

- ❒ I have researched several housing designs for chickens and made some decisions on what best fits my poultry flock.
- ❒ I understand the importance of sanitation and the six step process for effectively completing the task.
- ❒ I have taken steps to control pests.

Module 4

Egg Management & Meat Processing

Objectives

After you have completed this module, you will be able to:

- Reduce undesirable laying behaviours of your chickens
- Design a lighting program that allows hens to come into and stay in lay
- Train your chickens to use the nest boxes for laying their eggs
- Properly handle eggs to maintain quality and safety
- Get birds ready for processing.

In Module 3, you looked at housing for your flock and some of the requirements to make it safe and healthy for the flock and those caring for the birds. In this module you focus on creating conditions that provide for optimal egg production and quality.

In order to have quality eggs, you need to follow sound management techniques. Included in this section are coop necessities for egg layers, an egg handling and washing guide, as well as health advice for a condition called prolapse.

Undesirable Behaviours of Laying Hens

At approximately 22 weeks of age, a dual purpose hen begins to lay eggs. The key is to train her where to lay her eggs before she begins. Chickens are flock-minded and will copy whoever lays first and lay their eggs in the same place. If a chicken of the flock disappears to a quiet dark place (that is not a nesting box) and remains there, it is likely that she is attempting to lay an egg. Correct her behaviour and move her to the nest box immediately.

Training your chickens to use nest boxes is covered in more detail later in this module.

Another behaviour that needs to be corrected is one where a chicken eats her own eggs. Once a chicken tastes a raw egg, it is nearly impossible to stop her from breaking her own eggs. To prevent the behaviour, collect eggs 3 times daily. During hot and cold weather, collect eggs more frequently.

Module 5 focuses on other undesirable behaviours of chickens.

Lighting

Egg laying hens take approximately 5 to 6 months from hatch before they are ready to lay eggs. To bring chickens properly into lay, as a small flock producer, you must pay attention to a couple of things.

- First, ensure the weight of the bird is approaching that of a fully grown chicken (3-4 lb. or 1.4-1.8 kg for a hen).
- Secondly, pay attention to the amount of light available to the hen.

Chickens come into puberty by being photostimulated. Photostimulation most often occurs during the spring when the daylight hours get longer. Chicken producers have found that lighting inside a barn can also induce photostimulation in places where light cycles change. In Alberta, in particular, lighting your barns during the fall and winter becomes essential to keeping your birds in a lay cycle due to decreasing day length effects that lower egg production.

Photostimulation activates the reproductive organs and sexually matures the chicken.

While increasing the light by 30 minutes does bring the hens into sexual maturity earlier, those that are brought into lay slower (with the 15 minutes of additional light per week) are found to stay in lay longer. In the end, both systems were found to have the equivalent number of eggs laid per cycle.

When possible, use a lighting program that mimics the gradual lighting changes of sunrise and sunset. This can help egg production.

Recommended Step-up Lighting Program

- Start with 8 hours of light initially. This is the maximum amount of light your chickens should receive until they are at least 16 weeks of age.
- Once chickens have reached 16 weeks of age, increase the length of the day by 15 to 30 minutes per week until they have reached 14 to 17 hours of light per day.

Create a Lighting Schedule

Based on the guidelines above and using a calendar, create a schedule for increasing the length of light until the recommendation of 14 to 17 hours per day is reached. Indicate the age of your birds when this recommendation is reached. Note that your birds should be between 20 and 22 weeks old.

Nest Boxes

Until your chickens have reached laying age, do not allow them access to the nest box. If they have access to the nest box, they view the box as another area to soil instead of an area to lay eggs. Once you have started lighting the birds, allow them access to the nest boxes during the times that the light is on, but do not allow access during the night.

As discussed earlier, if you provide appropriately sized nest boxes filled with comfortable bedding, it encourages the birds to lay their eggs in a cleaner environment. Provide 1 nest box for every 3 to 4 hens. Nest boxes should be big enough for hens to stand up in as well as be able to turn around (see Figure 4-1 Nest Box Size).

Figure 4-1 Nest Box Size

Particularly when your birds are going through puberty and learning to lay eggs, it is important to train them to lay their eggs in a clean area. There are several key things you can do to encourage your chickens to lay eggs in the nest boxes.

Train Your Birds to Use Nest Boxes

- Walk your barns frequently during the first weeks of lay. Pick up any eggs that are found on the floor immediately.
- Place a golf ball in each of the available nest boxes to encourage "mimicking" behaviour.
- Ensure that the floor area of your coop has no shady areas.
- If you catch a hen displaying laying behaviors (seeking dark corners, pacing), place her in a nest box.
- Once your birds are nest box trained, pick up eggs in your coop at least twice a day.

If you remove eggs frequently, you reduce the broody behaviour expressed by your chickens and you reduce the level of bacteria exposure by the eggs.

Proper Egg Handling Techniques

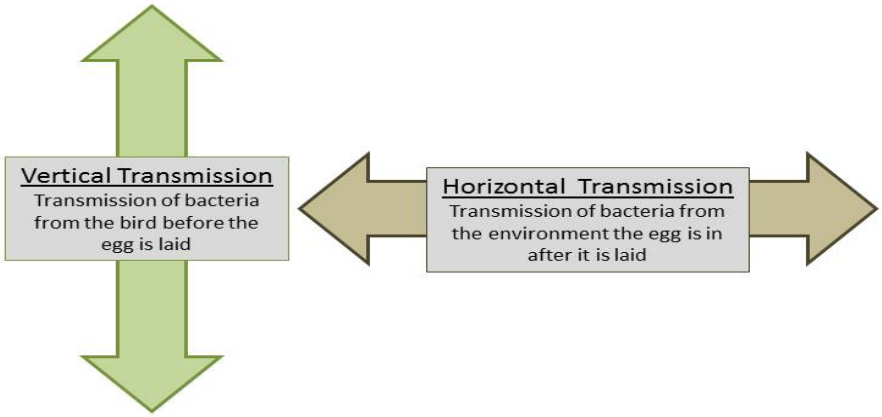
Vertical transmission can be prevented by:

- *Purchasing your birds from a reliable source*
- *Keeping your hens healthy (healthy birds that aren't experiencing stress are less likely to shed and spread bacteria)*
- *Proper sanitation between flocks to prevent bacterial infections in your flock.*

You can reduce horizontal transmission of bacteria by proper egg handling techniques and proper environment.

Eggs that are used for human consumption (also known as table eggs) need to be handled properly to reduce the potential for bacterial contamination. This contamination can occur from either vertical or horizontal transmission as illustrated in Figure 4-2 Bacterial Contamination of Eggs.

Figure 4-2 Bacterial Contamination of Eggs



While it is difficult to influence the vertical transmission, you can dramatically reduce horizontal transmission by providing a proper environment and using proper egg handling techniques.

Proper egg handling not only reduces the bacterial load, it also promotes food safety. Egg shells are not a solid surface. Instead, they have microscopic openings called pores to allow for the exchange of gases and moisture. While these pores are important for the eggs, proper handling of eggs is crucial to keep these pores clean. Eggs can become dirty from fecal matter, broken egg yolk, shavings and feathers.

At times, you may find a little bit of blood on an egg, especially when the birds are coming into lay. This indicates that a hen has laid an egg that was slightly too big for her (commonly double yolks). When you see blood on an egg, visually examine the bird for a prolapse.

Prolapse in Laying Hen

Prolapse is when a hen's oviduct becomes exposed on the exterior of the body. This can become a serious condition if left untreated. See Figure 4-3 Prolapse in Laying Hen.

Figure 4-3 Prolapse in Laying Hen

When laying an egg, it is normal for some tissues to become exposed; however, sometimes there are complications with laying an egg and a prolapse occurs. There are several different kinds of prolapses and actions required.

Oviductal prolapse: Call your veterinarian immediately.

Uterine and cloacal prolapse: Keep tissue moist. Removed the swelling using a light dusting of sugar on exposed tissues. Once swelling is reduced, you can try to re-insert the tissue using water-based petroleum jelly and gently re-insert tissue with the help of a cotton ball on a stick. If you encounter resistance, do not force! Call your veterinarian.

You can treat some types of prolapse yourself while others require a veterinarian.

With a pencil indicate on the shell the day that each egg was picked (table eggs are generally good for 6 weeks) so that you do not keep eggs past their expiry date.

"Residual clean" means that even after you have cleaned an egg, it will maintain its level of cleanliness for a time.

Egg Wash can be purchased through United Farmers of Alberta (UFA), Peavey Mart and most agriculture supply stores.

Candling is the first step in the grading process. To learn more about grading eggs, go to: http://www.eggs.ca/onthefarm/article/4/the-grading-station

Collecting Eggs

When you collect your eggs, take two different buckets into your coop. Use one bucket for clean eggs (ones without visible soiling) and another bucket for dirty eggs. By keeping your eggs separate, you reduce the chance that a dirty egg will spread its dirt onto a clean egg. Make sure you wash your hands before you pick up your eggs to avoid contamination from your hands.

Washing Eggs

Once you have collected your eggs, take your eggs to a separate location with an available sink. Because you will potentially be dealing with fecal matter, locate the sink away from food preparation areas.

Visibly Clean Eggs

Because visibly clean eggs still contain the potential to harbour bacteria, gently clean them with egg-wash powder prior to refrigeration. Using egg-wash powder provides a "residual clean" that will promote the greatest degree of food safety. The egg-wash powder contains chemicals that will continue to work even after the eggs have been removed from the solution or wipes.

Visibly Dirty Eggs

With eggs that have a visible amount of dirt on them (less than the size of a quarter), first use an egg brush to reduce gross soils. Next, wash the eggs with hot water (above 41°C) and a special egg soap called "Egg Wash". The temperature of the water must be 11°C warmer than the egg.

Avoid using other cleaners (like dish soap) as they do not clean eggs properly. Once washed, the Egg Wash ensures a residual clean that will promote the greatest degree of food safety.

Discard eggs with dirt spots greater than the size of a quarter, as they have potential for high bacterial counts. To avoid eggs that are very dirty, maintain a high level of cleanliness in your coop and train your birds to use the well bedded nest boxes. Keep misshapen, dirty and cracked eggs separate from clean eggs.

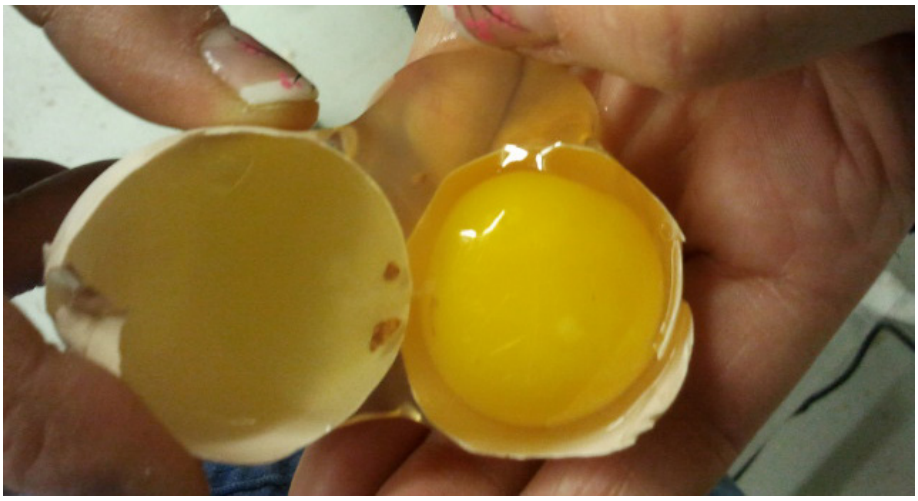
Candling

To look inside an egg, rotate the egg in front of a light source. This will help determine the quality of the egg's interior.

Meat Spots and Blood Spots

Most meat spots are tiny pieces of tissue from the hen's oviduct (see Figure 4-4 Meat Spot). They are usually brown in colour, and found in the thick albumen, chalazae or yolk. These spots are edible but may be removed with a knife.

Figure 4-4 Meat Spot



Most blood spots are caused by a rupture of a blood vessel on the yolk surface during the formation of the egg (see Figure 4-5 Blood Spot). These spots are edible but may be removed with a knife.

Figure 4-5 Blood Spot

See the following website for cooking guidelines:
http://www.eggs.ca

Refrigerating and Cooking Eggs

Once the eggs are cleaned, place them in the fridge but avoid storing them with strong smelling food such as onions which can alter the taste of the eggs. Consume eggs safely, following recommended cooking guidelines. Over-easy or sunny side up is not recommended as the entire egg may not reach proper temperature to kill all the bacteria that may be present.

Processing Chickens

See Module 1 Regulations for more information on processing chickens.

In order to eat the meat of your chickens, they need to be slaughtered and processed. In Alberta, meat processing regulations require that chickens to be sold to the public must be processed at a federally or provincially inspected facility. If you butcher an animal and process on your own property, you and your family can eat it, but you cannot sell the meat to the public.

If you are shipping meat between provinces or exporting out of the country, the chickens must be processed at a federally inspected facility. Some retailers may require you to process your chicken at a federally inspected facility.

> Note: Chickens that have finished their egg laying cycle are sometimes referred to as “spent hens”. The meat derived from these hens is excellent for making soups and stews.

When your birds (meat, dual, spent hens) are ready to be processed, take the steps outlined in Table 4-1.

Table 4-1 Steps to Get Birds Ready for Processing

Remove feed 8 to 12 hours before processing your birds	Follow the withdrawal feed times to prevent feed ending up in the crop and digestive tract, which increases the chance of fecal contamination of the carcass. If food is left to digest, you may be charged or your bird condemned. A condemned bird is thrown out, but you will still be charged a processing fee.
Turn lights off 2 hours before crating	Turn off the lights to calm the chickens down and reduce stress and the possibility of injury. Alarmed chickens will flap their wings and this can result in bruised, broken and damaged wings.
Keep vaccination records	Adhere to vaccination and medicated feed withdrawal times to prevent the meat processed being contaminated with the drug residue.

Conclusion

This module has provided you with some guidelines for maintaining quality and safety of your eggs through proper handling during collecting and washing of the eggs. You have also examined how to provide light and nest boxes that promote optimal laying conditions for chickens. In addition, you are now familiar with some of the regulations on processing chickens.

The next module is a short one and deals with both appropriate and inappropriate chicken behaviour.

Use the following checklist to assess your egg management practices.

Checklist

- ❒ I have nest boxes that are an appropriate size for my chickens.
- ❒ I understand the importance of light stimulation for laying hens.
- ❒ I can recognize inappropriate laying behaviour and take actions to correct it.
- ❒ I can recognize and deal with prolapse in hens.
- ❒ I have a system for collecting, washing and storing eggs to ensure quality and safety.
- ❒ I know the regulations on processing chickens.

Module 5

Appropriate/Inappropriate Behaviours in Chickens

Objectives

After you have completed this module, you will be able to:

- Describe appropriate behaviors in chickens
- Recognize inappropriate behaviours in chickens and take steps to prevent these behaviours.

In Module 4, you focused on how to manage your flock to produce quality and safe eggs. In this module, you start to look at the health of your flock by examining appropriate and inappropriate behaviours of chickens.

You must be able to recognize appropriate and inappropriate behaviour in chickens. This can help you recognize an unhealthy or unsuitable bird in your flock. To observe any problematic behaviours, try sitting on a chair in your chicken coop for short observation periods throughout the week.

Below are two charts that can help you determine some appropriate and inappropriate behaviours in your flock.

There are 3 types of chicken feather pecking: gentle, aggressive and severe. The first is appropriate while the second two are not.

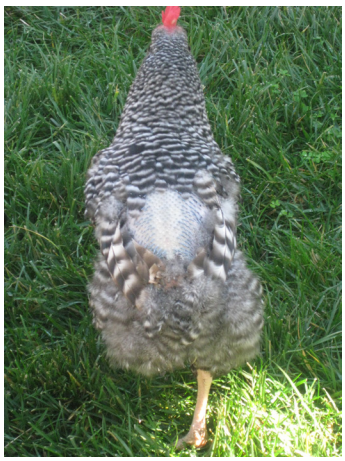
Aggressive Behaviour

Chickens can display aggressive behaviour towards new birds in the flock. If you are introducing new birds to your flock, quarantine them for 30 days in an area that is visible to the current flock. When you allow the birds to mix, monitor the birds 3 times a day to ensure the safety and welfare of your flock.

Appropriate Chicken Behaviours

Behaviour	Reasons for Behaviour
Foraging 	Foraging behaviour is displayed by ground scratching and/or pecking. A chicken will perform these behaviours regardless of what is in the environment.
Nesting 	Nesting behaviour is displayed when hens search for a covered nest; hens want to feel secluded and hidden. Provide 1 nest box to every 3 to 4 birds. Nesting is considered a behaviour need in poultry.

Gentle Pecking 	Chickens gently peck each other's feathers as an allogrooming or exploratory behaviour. Pecking is also used as a form of communication between birds.
Preening 	Chickens clean themselves by inspecting their feathers and rubbing oil from their preen gland onto their feathers. They also rearrange their feathers and make sure each one is securely fastened.
Dust Bathing 	Dust bathing is a social behaviour that both cleans feathers and aids in parasite removal. It is believed to be comfort behaviour in poultry.
Perching 	Perching is displayed when birds rest on anything that removes them off the floor or litter. The higher a bird perches, the more it is trying to get away from the other birds. Perches may act as a way to decrease aggression in the flock.
Roosting 	Roosting refers to behaviour where the bird rests or sleeps on branches or wooden beams higher than the ground.

Moulting 	Moulting in older laying hens rejuvenates the productive tissues which allow them to get ready for the next production cycle. Chickens will lose their feathers, replenish their skeletal calcium stores and regrow their reproductive tracts. It takes extra energy and protein for the birds to regrow their feathers. When moulting, chickens cease to lay eggs.
Mating Behaviour 	Roosters will fight one another to determine the most dominant male. This is normal behaviour that should not be interfered with. The dominant male will mate with the hens in the flock. Roosters will mate with hens frequently throughout the day. The rooster will grab the hen at the back of the neck. If the hen crouches, the rooster will then mount the hen. Mating is finished quickly and the hen will shake her body, ruffling her feathers when finished. During mating, a hen's back feathers tend to rub off.

Inappropriate Chicken Behaviours

Behaviour	Causes	Prevention
Aggressive feather pecking is displayed when a chicken pecks at another chicken's head or neck which can draw blood or induce bad bruising. 	• Overcrowding • Inadequate number of nest boxes • Hunger • Too much light • Overheating • Not enough stimuli • Flocks of different ages and colours grouped together	• Ensure required space • Add outdoor runs, more roosts and nest boxes (1 box to every 4 hens) • Ensure correct feed and lighting program for your flock

Severe feather pecking is when a hen actually grasps and pulls on the feather. 	• Redirected foraging behaviour	• Check temperature to see if birds are too hot or too cold • Provide forage areas and enrichment toys to prevent boredom
Repetitive pecking is displayed as obsessive pecking at empty feeders, water containers and walls. 	• Hunger • Too much light • Not enough stimuli	• Ensure correct feed and lighting program for your flock • Provide forage areas and enrichment toys to prevent boredom
Setting/brooding is when a chicken refuses to leave the nest box, saves her eggs and refuses to lay any more. 	• When a hen goes "broody" it means she wants to try to hatch a clutch of eggs	• Purchase fewer broody breeds • Move her out of the nesting box and monitor her closely • Make sure she is eating and drinking. If she refuses to leave the nest box, separate her from the flock and nest, and place her in an area where the flock can still see her. Give her water and food and, after a week, reintroduce her to the flock. Repeat if it happens again.
Lacking energy is displayed when the tail is droopy, eyes are sleepy, wings are droopy and there is a messy bum. 	• Disease • Temperature is too hot. Sick chickens will isolate themselves from the group	• Correct any management problems such as temperature or nutrient deficiencies. • Call veterinarian if you suspect a disease. • For more information on diseases, see Module 8

Assess Chicken Behaviour

Check your understanding of chicken behaviour by indicating whether the following behaviours are appropriate or inappropriate. Indicate the reason for the behaviour. If the behaviour is inappropriate, indicate how to prevent it.

Behaviour	Appropriate Yes	Appropriate No	Reason	Prevention
Obsessive pecking				
Moulting				
Rolling in the dust				
Refusal to leave nest box				
Ground scratching				
Aggression				

Conclusion

You should now be aware of both appropriate and inappropriate behaviours in chickens and be able to take some steps to reduce behaviour that is not appropriate.

The next module focuses on the specific care of chicks including their specific needs and some problems that can arise.

Use the following checklist to assess whether your management practices prevent inappropriate behaviours.

Checklist

- ❒ I prevent overcrowding by providing 1 nest box for every 4 hens.
- ❒ I introduce new chickens to the flock by first quarantining for 30 days where they are visible to existing flock.
- ❒ I ensure proper feed and water is supplied to the flock.
- ❒ I monitor the temperature to see if birds are too hot or too cold.
- ❒ I monitor for brooding and take actions to correct the behaviour.

Module 6

Care of Chicks

Objectives

After you have completed this module, you will be able to:

- Reduce your risk of spreading *Salmonella* when you handle chicks
- Provide an environment that meets the temperature, food and water requirements of chicks
- Recognize the symptoms of common chick problems and prevent or treat these problems.

In Module 5, you learned to recognize appropriate and inappropriate behaviours in chickens. This knowledge can help you prevent any undesirable behaviours.

This module is specific to chicks. Chicks require special care in order to survive and thrive. Proper care during a chick's first few weeks of life is crucial to having healthy adult chickens.

Health Risks

Salmonella is a health risk to those who own and handle chicks. **Do not allow children under the age of five to handle chicks.** Children at this age have a tendency to place their fingers in and around their mouths. You should never allow your children to kiss chicks or chickens. Poultry, including chicks, can carry *Salmonella. Salmonella* causes severe illness in people, especially in at-risk age groups such as the very young and old. Some symptoms of *Salmonella* include diarrhea, fever and abdominal cramps. Illness lasts between 4 to 7 days.

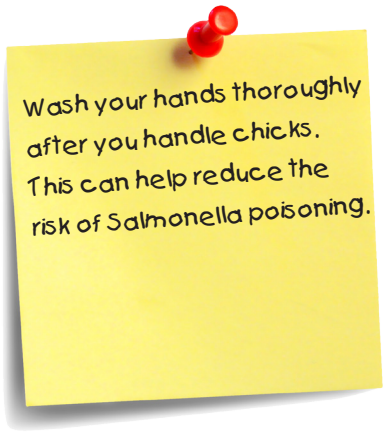
Spread of *Salmonella*

Salmonella can spread to the feathers, the beak and feet. The young chick will clean itself and spread the *Salmonella* all over its body. *Salmonella* can also be found in the environment of the chicken coop, making it very easy to track into your house. To decrease the risk of spreading *Salmonella* to yourself and others, wash your hands thoroughly before and after touching live birds (such as chicks).

Holding Chicks

Handle chicks using two hands. Use one hand to support the feet underneath and the other hand to contain the chick with the head being free to move (see Figure 6-1 Proper Holding of a Chick). If chicks are held too tightly, they may suffocate. Young chicks should never be squeezed. Chicks should not be dropped more than 6 inches (15 cm) on a hard floor and 12 inches (30 cm) on a soft floor (from the Recommended Code of Practice for Care and Handling of Farm Animals-Poultry-Layers).

Figure 6-1 Proper Holding of a Chick



Recommended Code of Practice for Care and Handling of Farm Animals-Poultry-Layers: http://www.nfacc.ca/pdfs/codes/poultry_layers_code_of_practice.pdf

Necessities for Survival

Some of the necessities for the survival of chicks include a brooder and the proper temperature, water and food.

Brooder

The brooder is where you house your chicks. It keeps the chicks and heat contained. Chicks grow very quickly in the first few weeks of life. When the chicks grow, they need to be moved to a larger brooder. There are many designs of brooders on the market with the most common ones including cardboard or wooden boxes, or large plastic totes (see Figure 6-2 Brooder Made from Large Plastic Tote). The sides of the brooder need to be high enough (more than 2 feet/.6 m) to keep chicks in. If the brooder is too short, you will find chicks perched on top of it or outside of the brooder. To discourage the chicks from leaving the brooder, you can place a wire mesh over the top. Chicks need enough space inside the brooder to move away from the heat source if it is too hot.

Brooder Setup

Brooder setup is crucial to keeping the chicks healthy. You will need: plastic tote, shavings, chick waterer and feeder, and heat lamp. It is crucial you teach the chicks how to drink and where to find their food.

Step 1 **Clean the Brooder**

Disinfect the plastic tote with Clorox wipes. Clean out the waterer and feeder with soap and water. Rinse thoroughly to get rid of any soap residue.

Step 2 **Place Shavings**

Place 2 inches (5 cm) of shavings in the plastic tote. Never use newspaper.

Step 3 **Correct Temperature**

Place the heat lamp across the beams (you can use plywood) so the heat lamp hangs over the top of the tote. The heat lamp must be high enough to give chicks the ability to escape from the heat, if needed, but also low enough to keep the chicks warm.

Figure 6-2 Brooder Made from Large Plastic Tote

You can purchase a brooder or make your own.

Temperature

Once the chicks arrive, place them in the brooder, close to the heater, food and water. It is important to measure the surrounding air temperature at the height of the chicks. The temperature should be 32.2°C (90°F). Chicks are dependent on external heat sources, so a working, height-adjustable heat lamp is crucial. You can remove the heater once the chicks are fully feathered, when they will then have sufficient insulation from their feathers.

See Figure 6-3 Effect of Temperature on Chick Distribution for illustrations on what happens when the temperature is too high or low or when there is a draft.

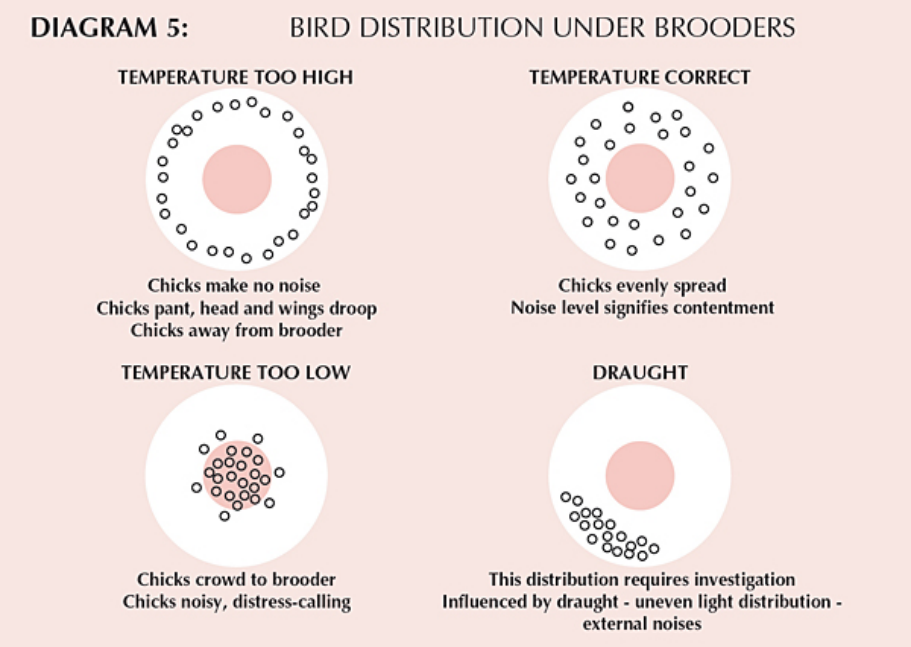
See more detailed information on the correct temperature below.

The University of Minnesota has created three educational videos that can help you prepare the brooder for your chicks. A subscript is included with each video. http://www.extension.umn.edu/food/small-farms/videos/

Go to General Brooding and Rearing factsheets for more information on brooding temperature and housing requirements:

http://www.agriculture.gov.sk.ca/Livestock-Poultry

Figure 6-3 Effect of Temperature on Chick Distribution



Water

Guide the chicks to the water source, and dip their beaks into water. Chicks need your physical prompting during their first drink of water in order to learn how to drink. Place waterers at a height that chicks can reach. Keep a close watch on the chicks to ensure that each one has learned how to drink. If you are using nipple/cup drinkers, activate the nipples and fill cups until you can observe the chicks are using the nipple drinkers.

Food

Commercial feed stores sell chick starter. If you are mixing your own feed, get some advice from a feed mill or feed store. Do not provide grit to chicks until after their first week of life.

Coccidiosis

Find out whether your chicks have been vaccinated for coccidiosis. If they are not vaccinated, feed them medicated feed. If they have been vaccinated against coccidiosis, feed them unmedicated feed. Symptoms of coccidiosis include lethargy, listlessness and reduced weight gain. It may result in death.

Common Chick Problems

The following chart (Table 6-1 Common Chick Problems) provides a list of common chick problems, the cause of these problems and some possible ways to prevent or solve the problem.

Table 6-1 Common Chick Problems

Problem	Cause	Prevention / Solution
Suffocation/smothering	• Temperature too cold so chicks will huddle to stay warm but may suffocate chicks underneath • Chicks when frightened will pile together at the risk of suffocating a chick underneath • Chicks may have been held too tightly during handling	• Adjust temperature • Use a calm approach • Use appropriate handling techniques • Wear darker colours (navy, blue, black); birds respond in a calmer manner to darker colours
Starve-Out Chicks do not eat within the first 2-3 days	• Chicks in transit too long • Temperature around feeders is too hot or too cold • Feeders are too high or located where chicks cannot find them	• Purchase chicks from reliable source • Monitor temperature around feeders and adjust temperature if necessary • Provide enough feeders • Place feeder where chicks can easily find and access feed
Dehydration	• Brooding temperatures are too high • Chicks are not drinking water or cannot locate water source	• Constantly monitor • Supply fresh water • Chicks need to be shown the water source and physically have their beaks dipped in the water
Pasty Butt Feces stuck to chick's vent (where manure & eggs come out)	• Stress during transport • Overheated • Too cold • Wrong feed	• Constantly monitor • Take immediate action • Gently swab with damp cotton swab, wash-cloth or paper towel and dry gently • Adjust temperature if too hot or cold • Provide appropriate chick starter
Omphalitis Yolk sac infection from unhealed navels -lack of energy -lack of appetite -sudden death	• Low brooding temperatures can lead to unhealed navels • Chicks removed from hatchery too early	• Buy from reputable source • No known treatment
Spraddle Legs Also called perosis/slipped tendon	• Bedding that does not have adequate traction, such as newspapers	• Use bedding that provides adequate traction (avoid newspaper as it is too slippery). • Treat gently by bringing legs closer together and using a bandage to correct legs
Curled Toe Paralysis	• Breeder hens (chicks' parents) were fed non-supplemented breeder ration • Nutrient deficiency • Lack of riboflavin (vitamin B_2)	• Feed appropriate chick starter • Provide multi-vitamin/mineral supplement

Identify Chick Problems

Check your understanding of chick problems, their causes and prevention or treatment by completing the chart below.

Cause or Condition	Possible Problems	Treatment or Prevention
Temperatures too hot	_____	_____
Wrong feed or ration	_____	_____
Temperature too cold	_____	_____
Stress during transport	_____	_____
Chicks are frightened	_____	_____

Conclusion

This module has introduced you to some specific requirements of chicks in order for them to survive and thrive during the first few weeks of life. You should have an understanding of specific problems that chicks may experience and know how to treat or prevent these problems.

The next module looks at the unique challenges that owners in Alberta face in dealing with winter conditions.

Use the following checklist to assess how well your management practices meet the needs of chicks.

Checklist

- ❒ I take steps to prevent *Salmonella* contamination of myself and others.
- ❒ I hold chicks in the proper manner and teach others proper handling.
- ❒ I provide an environment that meets the temperature, food and water requirements of chicks.
- ❒ I recognize the symptoms of common chick problems and understand how to prevent or treat these problems.

Module 7

Care of Chickens During the Winter

Objectives

After you have completed this module, you will be able to:

- Select a chicken breed that is suited to the climate in Alberta
- Prevent frostbite in birds spending time outdoors and prevent freezing of eggs
- Winterize the coop by using insulation, widened perches and proper ventilation.

In Module 6, you examined the specific requirements to keep chicks healthy during the first few weeks of life. In this module you focus on keeping your flock healthy during the winter in Alberta.

Winter can bring unique challenges to poultry owners through increasing chances of frostbite, respiratory illnesses and behaviour problems. Potential behaviour problems can include both aggressive and severe feather pecking. Your goal over the winter is to have healthy birds that display the following.

Example Signs of a Healthy Bird

- Bright coloured eyes, red combs and wattles
- Complete plumage
- Active
- Eating and drinking normally
- No evidence of parasites.

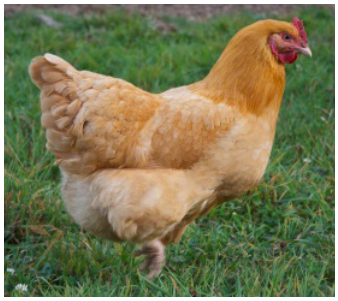
Breed Selection

Choose breeds that can withstand Alberta's winters.

If your goal is to maintain chickens over the winter, it is important to be selective when choosing your chicken breed. Choose breeds with small combs and wattles to decrease the chance of frostbite. Choose a bird with lots of feathers to provide insulation. See Table 7-1 Breeds Suitable for Winter for a list of suitable breeds.

Table 7-1 Breeds Suitable for Winter

Breed	Features	Breed	Features
Chantecler	Cushion comb	Dominique	Rose comb, thick down
			

Breed	Features	Breed	Features
Hamburg	Rose comb	Wyandotte	Rose comb, thick feather
			
Jersey Giant	Single comb	Orpington	Single comb
			
Plymouth Rock	Single comb	Rhode Island Red	Single comb
			
Light Sussex	Single comb		
			

Frostbite

Exposure to extreme cold temperatures can result in damage to the wattle, comb and toes. At first, wattles, combs and toes turn pale, and then turn black, swell or shrivel (see Figure 7-1 Comb with Signs of Frostbite). The frostbitten parts may eventually fall off. If frostbite does occur, separate the bird from the flock and apply a warm damp cloth to the injured area for approximately 10 minutes.

To prevent frostbite, reduce moisture (humidity) in the coop by removing any wet litter and providing proper ventilation to allow moist air to escape the coop. If chickens are allowed outside, monitor the amount of time spent outdoors.

If a chicken moults during the winter, it is at risk of developing frostbite. Keep moulting chickens indoors and provide a heat source and extra protein in their feed.

Figure 7-1 Comb with Signs of Frostbite

To prevent frostbite, reduce moisture in the coop and monitor the time chickens spend outdoors.

Egg Handling in Winter

Without proper insulation in the nest boxes, eggs can freeze. Eggs that are frozen are cracked and look as if they are hard boiled (see Figure 7-2 Frozen Cracked Eggs). Collect eggs often to prevent breakage and wastage.

See Modules 2 and 4 for more information on light needs of egg-laying chickens.

To keep hens laying all year round, you need to provide supplemental light to account for the decrease in natural light during the winter months. Chickens require 14 hours of daylight to stay in production. To conserve electricity, use a time sensor.

Figure 7-2 Cracked Frozen Eggs

Enrichment

When chickens are enclosed in a space, especially if they have previously been allowed outdoors, they become bored and may display an increase in severe feather pecking. Chickens love to dust bathe and forage (see Figure 7-3 Chicken Dust Bathing and Figure 7-4 Chicken Foraging). Place peat or sand to encourage dust bathing. Enrichment should decrease the amount of aggressive bird behaviour such as severe feather pecking. Some examples of enrichment include providing dust bath material, dangling strings, hiding treats inside of straw bales and adding ramps with grip. Music such as classic or jazz can calm birds and keep them enriched acoustically.

Figure 7-3 Chicken Dust Bathing

See Module 5 for more information on chicken behaviour.

Figure 7-4 Chickens Foraging

Winterizing the Coop

In the poultry house, either due to a draft, improper ventilation or mismanaged heating system, there can be inconsistent temperatures that can create hot and cold regions. Temperature fluctuations can increase the likelihood of a disease or illness.

Make Your Coop More Winter Proof

- Position the chicken house to reduce any wind exposure.
- Place your windows in the chicken coop facing south to catch more light during the winter months.
- Ensure the roof is sturdy enough to withstand the weight of heavy winter snow.

Draft-Free

See Module 3 for more information on coop design.

If you are using fixed housing with an outdoor run, you can add plastic to the sides of the run to protect the flock from wind-chill and drafts. Once wind ruffles a chicken's feathers, it reduces the insulation value of the feathers.

Ventilation

As much as you need warm air to stay in the coop, you also need to let moisture out. Too much moisture in the coop can be deadly for chickens. Provide an inlet for fresh air and an outlet for warm air to escape. Placement of ventilation is crucial and must be up high near the roof. The ventilation must also be protected from the elements; you do not want snow, hail, sleet or rain to enter the coop. You also need to ensure predators and pests cannot get into the coop.

Types of Natural Ventilation

Natural ventilation can include inlet door opening, open window(s), ventilation slot, gable or louvered vents. Mechanical ventilation can consist of an electrical fan or wind turbine. If the roosts are too close to the ventilation opening, you risk giving your chickens a draft.

Roosts

When chickens roost at night, their feet can overhang and subject them to frostbite. If you provide a widened perch, the chicken's feet will be less likely to freeze. See Figure 7-5 Chickens Roosting on Widened Bench.

Figure 7-5 Chickens Roosting on Widened Perch

Insulation

Some common insulation materials are polyurethane spray foam, glass wool, fibreglass and reflective materials, or straw bales. Add a vapour layer to prevent condensation on the wall. Insulation must never be exposed as chickens will ingest insulation material. Cover up any insulation with plywood or other durable material. Look at R-value (see Figure 7-6), and make sure it is designed for winter temperatures.

Figure 7-6 Insulation R-value

Insulation Types	12	24	38
Batts			
Fiberglass	3.5"	7"	12"
Loose-Fill			
Fibreglass	5"	10"	17"
Cellulose	3"	6"	11"
Rigid Board			
Polystyrene (extruded)	3"	5.5"	9.5"
Polystyrene (bead board)	3"	6"	10.5"
Urethane	2"	3.5"	6"
Fiberglass	3"	5.5"	9.5"

Use the following guide to determine which R-value is best for you:

Canada

http://www.cmhc-schl.gc.ca/en/co/grho/grho_010.cfm

USA

http://www.naima.org/insulation-knowledge-base/residential-home-insulation/how-much-insulation-should-be-installed.html

Conclusion

In Alberta, you must be able to protect your flock from the cold winter temperatures. This module has provided some ways to protect your chickens from frostbite and make the coop more draft-proof and insulated.

The next module looks at bird health and disease. You are introduced to methods of vaccination as well as common infectious diseases of poultry in Alberta.

Use the following checklist to assess how well your flock is protected during the winter.

Checklist

- ❒ I have selected breeds that can withstand the cold winter conditions in Alberta.
- ❒ I take steps to prevent frostbite, particularly if chickens spend time outside.
- ❒ I have winterized the coop with insulation, widened perches and proper ventilation.
- ❒ I have provided some enrichment for the chickens to prevent boredom and undesirable behaviours.

Module 8

Health and Disease of the Flock

Objectives

After you have completed this module, you will be able to:

- Describe the various means of vaccination and the need to adhere to withdrawal times
- Collect items for a first-aid kit for your flock
- Recognize the signs of various infectious diseases and reporting requirements.

In the previous module you looked at the unique challenges that winter brings to poultry owners through increasing chances of frostbite, respiratory illnesses and behaviour problems.

This module focuses on how the health of a flock can be affected by environmental factors, poor management techniques and disease causing agents. Birds can suffer stress from severe weather, overcrowding and poor nutrition. Any one or all of these factors can result in disease.

You can ward off some diseases by practicing good husbandry; however, you will need to address some diseases with vaccines.

Vaccinations

Vaccines are important to the health of your flock because they prevent diseases by boosting a chicken's immune system (see Figure 8-1 Vaccination of a Chick). Diseased birds can continue to affect other birds in your flock and risk spreading disease to other flocks if you have contact with other chicken farmers.

Note that hatcheries may sell chicks with a vaccination package. It is recommended that you purchase vaccinated chicks from the hatchery.

As a chicken owner, adhere to the following best practices:

- If the birds need to be vaccinated, seek veterinary assistance to ensure proper administration.
- Double-check the vaccination status with your chick supplier.
- Ensure proper storage and administration of the vaccine according to label or prescribed directions.
- Clean and disinfect tools that are used to administer vaccines.

Figure 8-1 Sharps Container

Purchase vaccinated chicks from a hatchery.

Needles should be handled very carefully as there is the danger of prick injuries providing an entry point for pathogens and the vaccine being administered. If pricked, seek medical help immediately. Dispose of needles in a labelled, sharps container (see Figure 8-1 Sharps Container).

Withdrawal Times

Adhere to all vaccination withdrawal times. A withdrawal time on a drug label indicates the drug's elimination rate, or the number of days that must pass before you can safely butcher a bird for meat. In the case of laying hens, it is recommended that you add another ten days to the withdrawal date as residue from the drug can stay in the developing egg for that long. Most vaccinations and antibiotics have specified withdrawal times listed in the instructions on the bottle or insert sheet.

For more information on vaccines, go to:

www.poultryhub.org/health/health-management/vaccination/

www.canadianpoultry.ca/principles_of_vaccination.htm

Vaccination Methods

Depending on the type of vaccination, there can be different methods used. Table 8-1 Vaccination Methods provides a list and brief description of the types of vaccination that could be used by your veterinarian.

Table 8-1 Vaccination Methods

Vaccination Method	Description
In Ovo-Vaccination	This vaccine is administrated to the egg at the hatchery at 18-19 days of incubation.
Intramuscular Injection	The vaccine is injected into the breast muscle, thigh, wing or tail head.
Subcutaneous Injection	The vaccine is injected at the back of the neck, under the skin or the inguinal fold.
Ocular	The vaccine is dropped into the eye using an eyedropper.
Nasal	The vaccine dust or drop is placed into the nostril.
Oral	The vaccine is given through the mouth.
Drinking Water	The vaccine is added to the drinking water.
Cloacal	An abrasive applicator is dipped into the vaccine and inserted into the cloaca through a twisting motion.
Feather Follicle	Some feathers are removed and the vaccine brushed into the follicle.
Wing Web Stab	The vaccine needle is inserted through the wing web.
Spray	Atomized vaccine droplets are both inhaled and ingested (chickens peck droplets that fall onto feathers).

Chicken First-Aid Kit

Your chickens may get sick or injured and some may even need to be euthanized. Separate sick or injured birds from the rest of the flock during treatment and recovery. Typical chickens will respond to treatment within 48 hours.

Assemble a First-Aid Kit

Use the following checklist to help you assemble a first-aid kit to treat minor injuries or diagnose disease or euthanize a bird.

- ❒ The number to reach your veterinarian: _____
- ❒ Euthanasia Guide http://www.chickenfarmers.ca/wp-content/uploads/2014/05/CFC-Euthanasia-Guidelines.pdf
- ❒ Separate cage /pen or kennel to separate a sick or injured bird from the flock
- ❒ Spare heat lamp to warm a chilled bird that needs to be separated, or use as backup for brooder supplies
- ❒ Band-aids to correct straddle leg in chicks
- ❒ Sterile suture kit with dissolvable thread
- ❒ Tweezers to remove debris or inspect wounds
- ❒ Rubber/latex gloves to protect yourself and your chicken from spreading any bacteria infection or disease
- ❒ Gauze
- ❒ Adhesive cloth bandaging tape
- ❒ Instant vitamin mix and electrolytes for dehydrated birds

If your flock exhibits any of the following symptoms, contact your veterinarian immediately:

- *High mortality (greater than 0.5% of your flock for 2 days in a row).*
- *An egg production drop of more than 5% over 2 days.*
- *Drastic change in feed and/or water consumption.*

These can be signs of serious, contagious disease and should be investigated immediately.

For a complete list of reportable diseases, go to: http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/cpv12455

Disease

As the owner of chickens, you need to be able to recognize signs of disease and notify authorities immediately if you suspect a serious bird disease.

Provincially Reportable and Notifiable Diseases

You, as the bird owner, are legally required to notify authorities if a provincially reportable or notifiable disease is found on your farm. Reportable diseases are those which require action to control or eradicate because they are a threat to animal or human health, food safety or the economy. Notifiable diseases are those which require monitoring for trade purposes or to understand their presence in Alberta, but no actions will be taken.

The provincially reportable diseases for different types of poultry (domestic chickens, bantams, pheasants and pea fowl) are:

- Disease caused by any toxic substance that is a threat to animal health or human health.
- Highly pathogenic avian influenza or all strains of H5 or H7 influenza/virus
- Infectious laryngotracheitis
- Newcastle disease
- *Salmonella* Enteritidis
- *Salmonella* Gallinarum
- *Salmonella* Heidelberg
- *Salmonella* Pullorum
- *Salmonella* Typhimurium

Health Questions

For any health questions about your flock, contact a veterinarian.

If you suspect your flock has a provincially reportable or notifiable disease, contact the Office of the Chief Provincial Veterinarian at 780 427-3448 or
toll-free by first dialing 310-0000. For calls after business hours, dial 1 800 524-0051.

Infectious Diseases in Alberta

For a list of some of the infectious diseases of chickens, see Table 8-1.

A table that matches symptoms with the possible disease can be found at http://edis.ifas.ufl.edu/ps044

Table 8-1 Infectious Diseases in Alberta

Disease	Symptoms	Prevention
Avian Influenza (AI) Avian influenza is a high risk disease because it is highly infectious. It has a high impact on the producer and the poultry industry. Migratory birds and waterfowl carry AI viruses and may contaminate domestic poultry through feces (manure). Birds with AI undergo high mortality, a severe drop in quality and quantity of egg production (eggs may lack shells). Export markets may close their doors to poultry products; culling of infected flocks is necessary to stop the spread of the disease.	Birds lack energy and are inactive, increase water consumption, have swollen combs and wattles around eyes, red patches on legs, tremors of head and neck, and paralysis.	To prevent the spread of disease, use biosecurity measures: Prevent contact with wild birds especially migratory birds and waterfowl. Protect feed and water source from contamination with manure from wild birds. Quarantine all new and returning birds for 30 days before introducing them to your flock. Keep the coop clean, do not share any farm equipment, dedicate boots to poultry barn and use clean boot wash before and after visiting birds, and restrict visitors. Use wild bird deterrents to keep wild birds away from your flock.
Coccidiosis Coccidiosis damages the gastrointestinal tract which hinders nutrient uptake which results in poor feed conversion and weight loss.	Symptoms of a coccidiosis case within a flock can include watery and bloody feces, poor performance (drop in egg production) and mortality.	Prevention methods include vaccination or medicated feed. Never vaccinate and give medicated feed at the same time.
Colibacillosis *Escherichia coli (E.coli)* causes infection in chickens if large numbers gain entry to the bloodstream from the respiratory tract and intestine.	It can damage different organs and cause death in young chicks.	Clean living conditions decrease the chance of *E.coli* infection developing. Chickens can be vaccinated against certain strains.
Infectious Bronchitis Infectious bronchitis is a highly contagious disease that can be spread through contact with infected equipment, feces and aerosols, and through ingesting contaminated feed, water and litter.	Symptoms include lack of appetite and decreased water consumption. Birds will have watery eyes and nostrils and make a high pitched chirping sound. Egg shells can become rough and the egg white becomes watery.	Obtain vaccinated chicks from a reliable source; vaccinate your flock. Practice strict biosecurity. Keep coop clean, use clean boots and wash hands.
Infectious Laryngotracheitis ILT Infectious laryngotracheitis (ILT) is a highly contagious respiratory disease caused by a herpes virus.	With the mild form of ILT, symptoms include watery nostrils and eyes, and decrease in egg production. A severe form of ILT has symptoms such as severe coughing, and mouth and beak may have traces of blood. There is high mortality.	Vaccinate your birds. Prevention is through using strict biosecurity measures: keep the coop clean, do not share any farm equipment, dedicate boots to poultry barn and use clean boot wash before and after visiting birds, and restrict visitors.

Marek's Disease Marek's disease is a highly contagious viral neurological disease. Viruses replicate in the feather follicles, are released into the environment and survive for months in litter or dust.	Symptoms include transient paralysis, persistent neurological damage and death.	The best line of defense is to buy vaccinated chicks from a reputable source and keep the coop clean.
Mycoplasma synoviae *Mycoplasma synoviae* infection in poultry (infectious synovitis) is a chronic infection found in the upper respiratory tract. This infection is found in mostly multi-aged flocks.	If infected, birds slow their movements and become lethargic, some form breast blisters, others show signs of respiratory distress (heavy breathing and wheezing).	To prevent this disease, keep chickens the same age. Do not buy chicks from flocks that have had *Mycoplasma synoviae*.
Staphylococcus aureus *Staphylococcus aureus* infection is normally caused from contamination from an open navel at a hatchery or an infected wound.	Symptoms include decrease in weight gain and egg production, lameness and mortality. Note: Can cause food poisoning in people.	To avoid infections, remove objects that may cause injury. To prevent food-borne illness, thoroughly wash your hands before and after touching any live or raw poultry. Cook poultry products thoroughly.
Ecto (External Parasites) Parasites such as lice and mites are common in poultry and will live on or just under the bird's skin. Parasites generally live off the chicken's blood.	Symptoms can include decreased food and water intake, red itchy skin and feather removal.	Periodically examine your birds to avoid infestation. Inspect your birds for mite infestation, under the feathers near the flesh. Once the parasite is identified, take the appropriate measures.
Newcastle Disease Newcastle disease is a viral Foreign Animal Disease that affects the respiratory, digestive and nervous system of poultry. It is highly contagious and spread in droppings and nasal discharges.	Symptoms include sudden onset of hoarse chirps, face swelling, diarrhea, tremors, torticollis and paralysis.	Obtain vaccinated chicks from a reputable source. Practice strict biosecurity.
Salmonella	See Module 9	
Campylobacter	See Module 9	

For more information on external parasites, go to:
http://www.extension.org/pages/66149/external-parasites-of-poultry#.VPYFJU1rY2w

To help determine the parasite type and subsequent treatment, go to:
http://www.ksre.ksu.edu/bookstore/pubs/MF2387.pdf

Identify Possible Disease

Given the following symptoms, indicate some possible diseases. Use the resource below and Table 8-1 to match symptoms with the possible disease. Adapted from: http://edis.ifas.ufl.edu/ps044

Clinical Signs	Combined Symptoms	Possible Cause
Coughing	Coughing with blood	
Wheezing	If lethargic, shows signs of respiratory distress such as heavy breathing and gasping	
Eye and nasal discharge	Accompanied with high pitch chirping, egg shells become rough and egg whites watery	
Swelling of face, wattles	Accompanied with red/white spots on legs/comb, reduced appetite, tremors and paralysis	
Paralysis	If accompanied with hoarse chirps, watery discharge and paralysis If accompanied with high mortality rate and green watery diarrhea	

See page 8-10 for possible answers.

Conclusion

In this module you have looked at the various methods of vaccination and the reasons you might purchase vaccinated chicks or have your own flock vaccinated. Table 8-1 provided you with a list of common chicken diseases, symptoms of those diseases and some ways to prevent the diseases.

The next module looks at some of the human health risks associated with keeping chickens and provides you with ways to reduce that risk.

For a quick reference guide of disease risk, go to Appendix A: Biosecurity Risk Levels of Selected Poultry Diseases: http://www.poultryindustrycouncil.ca/pdfs/SOP.pdf

For a guide to poultry anatomy and diseases, go to: http://www.lahinternational.com/clientuploads/pdf/PoultryAnatomyEng_w.pdf

Use the following checklist to assess whether your management practices help prevent some of the common diseases of chickens.

Checklist

- ❒ I vaccinate or purchase vaccinated chicks to prevent those diseases that can be controlled by vaccination.
- ❒ I practice the following biosecurity measures: keep the coop clean, do not share any farm equipment, dedicate boots to poultry barn and use boot wash before and after visiting birds, and restrict visitors.
- ❒ I know the reportable diseases and follow the standards for reporting of these diseases.

Answers: Clinical Signs for Common Poultry Diseases

Clinical Signs	Combined Symptoms	Possible Cause
Coughing	Coughing with blood	Infectious Laryngotracheitis
Wheezing	If lethargic, shows signs of respiratory distress such as heavy breathing and gasping	*Mycoplasma*, ILT
Eye and nasal discharge	Accompanied with high pitch chirping, egg shells become rough and egg whites watery	Infectious Bronchitis
Swelling of face, wattles	Accompanied with red/white spots on legs/comb, reduced appetite, tremors and paralysis	Avian Influenza
Paralysis	If accompanied with hoarse chirps, watery discharge and paralysis If accompanied with high mortality rate and green watery diarrhea	Newcastle Disease Marek's Disease

Module 9

Keep Your Family Safe

Objectives

After you have completed this module, you will be able to:

- Describe several food-borne illnesses and how to prevent them
- Take five simple steps to protect you and your family from getting ill
- Choose personal protective equipment to protect you from injury and illness when working with chickens and in the coop
- Take safety precautions to keep children safe around chickens.

In the previous module you looked at diseases of chickens and how to keep your flock healthy through vaccination and biosecurity measures.

This module focuses on the safety of your family. Safety for your family involves preventing the spread of disease, following food safety guidelines and wearing personal protective equipment. Included in this module are common food-borne diseases and preventative measures against illness and injury.

Infection and Disease Spread from Poultry to People

One of the serious diseases that can spread from poultry to people is avian influenza. Although possible, this is extremely rare. People risk contracting avian influenza if they are in direct contact with infected live birds or have had close contact with a person infected with avian influenza. If you are working with poultry, you should get an annual flu shot. If you have the flu, avoid doing chores in your coop. If you suspect illness in your flock, contact a veterinarian immediately. To prevent the spread of disease, use biosecurity measures: use dedicated equipment and wash hands.

For more information on avian influenza, see Module 8.

Food-Borne Illnesses from Contaminated Meat and Eggs

There are many food-borne hazards that can impact human health. Any food has the potential to be contaminated and be a source of food-borne illness, including meat and eggs. Food-borne pathogens that are common in poultry are *Campylobacter* and *Salmonella;* however, there are other less common food-borne pathogens that can contaminate poultry and eggs. The pathogens include *Listeria, Staphylococcus* and *Clostridium perfringens.*

Salmonella

Salmonella bacteria are found in many different environments and are common in poultry. The bacteria are transmitted from the infected hen to the egg and are also shed in feces, contaminating the environment. If you eat *Salmonella* infected foods, you can get food poisoning. Food poisoning can be very serious for children and older people.

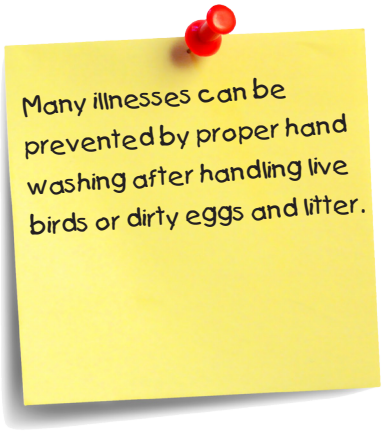
Prevention

To prevent *Salmonellosis*, wash your hands after handling chicks, chickens, animal feed, barn equipment, chicken housing equipment and materials. Wash your hands after handling fresh eggs. Cook poultry products to a safe internal temperature (*See Five Steps to Avoid Getting Sick on page 9-6).*

For more information on Salmonella, go to:
http://www.cdc.gov/healthypets/resources/salmonella-baby-poultry.pdf

Campylobacter jejuni

Campylobacteriosis is an illness caused by the *Campylobacter* bacteria. It is found in the intestines of wild and domestic animals. Poultry can carry *Campylobacter* without becoming ill, but these bacteria can spread from animals to humans through close contact with infected animals, improper food handling and poor hygiene practices such as not washing hands before eating food after handling dirty eggs, litter and live birds. *Campylobacter* attacks the digestive system, and a person may experience abdominal pain, vomiting, diarrhea and fever.



Prevention

To prevent campylobacteriosis, follow food safety guidelines when you prepare, cook and serve your poultry products. Always wash your hands before and after touching raw poultry and eggs. Also always wash your hands before and after touching live birds, including chicks.

Listeria Monocytogenes

This bacterium is naturally carried by animals, such as poultry, and can contaminate the meat if it is not handled safely. If you use chicken manure as a fertilizer, you may contaminate vegetables in your garden. Only manure that has been properly composted should be used in the garden. Symptoms of listeriosis include flu-like symptoms such as fever and diarrhea but also confusion and incoordination.

Prevention

To prevent this illness, wash your hands before and after you prepare food. Prepare meat on a separate cutting board to prevent cross-contamination. Always wash and disinfect kitchen tools such as knives. *Listeria* bacteria can grow in your refrigerator. It is crucial to wipe up, wash and disinfect any spills. When you defrost chicken, make sure any juices are contained and will not contaminate other foods.

Staphylococcus

Staphylococcus bacteria can be found in the mouth and nose of animals and people. It is commonly transferred to food by the food handler. If the food is not properly refrigerated, bacteria will grow and contaminate the food.

Prevention

To prevent sickness from *Staphylococcus*, wash your hands properly before and after touching live animals and poultry products. Always refrigerate or freeze food within two hours of cooking. Check refrigerator and freezer temperatures and adjust if not cold enough.

Clostridium Perfringens

Clostridium perfringens bacteria are found in the environment, especially in soils, sewage and dust. Food can become contaminated with the bacteria when a food handler improperly handles the food with unwashed hands and does not store the food properly. The bacteria are more commonly found at establishments that serve large quantities of food. The bacteria affect the gut and tend to cause symptoms such as bloating, increased gas, diarrhea and nausea.

Prevention

To prevent contamination, always wash your hands thoroughly before handling food and store and refrigerate properly. Once food is cooked, if it is left to stand too long, the heat resistant bacteria spores may germinate and the growing bacteria will produce a toxin, contaminating the food. (See Five Steps to Avoid Getting Sick on page 9-6.)

See Table 9-1 for a summary of some common food-borne pathogens, the cause of contamination and symptoms of the contamination.

Table 9-1 Common Food-Borne Illnesses from Poultry

Pathogen	Exposure	Symptoms
Campylobacter jejuni	Raw poultry, undercooked poultry, live poultry, dirty eggs	Diarrhea, abdominal pain, fever, nausea, vomiting
Salmonella	Raw poultry and eggs, undercooked poultry, live poultry or contaminated eggs	Fever, chills, diarrhea, abdominal cramps, headache (with sudden onset), nausea, vomiting
Listeria	Contaminated poultry and poultry by-products	Vomiting, nausea, severe headache, constipation, cramps, diarrhea, persistent fever, still births and fetal abnormalities.

Five Steps to Avoid Getting Sick

Most food-borne illnesses can be avoided by following some simple food safety measures. Take the following five simple steps to protect you and your family from food-borne illness.

Step 1 Shopping

- Bag meats separately from other produce.
- Buy perishable items before the expiry date. Do not store groceries in the trunk for any length of time. Take them straight home unless there is a cooler in use.

Step 2 Preparation

- Wash your hands before and after touching raw poultry and other foods.
- Wash your hands after using the washroom and changing diapers.
- Designate separate cutting boards for meat, vegetables and fruit, and dairy. This will prevent cross contamination.
- Always use clean knives when preparing food.

Step 3 Storage

- Keep refrigerator at 4°C or colder.
- Do not leave foods in the danger zone (between 4°C and 60°C).
- Cook, refrigerate or freeze raw poultry and eggs within 2 hours.
- Label the date the product was stored.

Step 4 Cooking

- Use a clean thermometer to determine inner temperature of meat at the thickest part.
- Cook poultry so that the inner temperature is a minimum of 74°C; this includes breasts, thighs and legs.
- Cook egg dishes to a minimum inner temperature of 72°C.
- Reheat leftovers to a minimum of 74°C.

Step 5 Serving

- Serve hot foods at 60°C and above.
- Serve cold foods at 4°C and below.
- Wash hands before and after serving food.
- Refrigerate or freeze foods containing poultry and eggs within 2 hours of cooking.

You can avoid most food-borne illnesses by proper hygiene and food handling practices.

Gather Emergency Numbers

Write down any emergency numbers missing from the list below and post the list on your fridge and barn/coop.

Poison Control: 1 800 332-1414

Fire/Police/Ambulance: 911

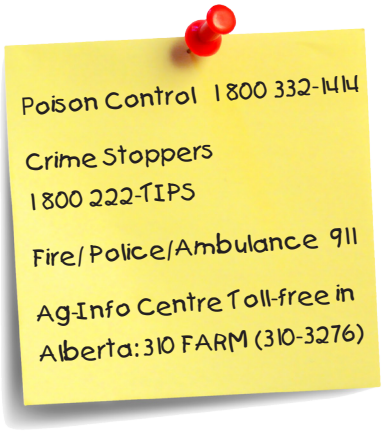
Crime Stoppers: 1 800 222-TIPS (8477)

Ag-Info Centre Toll-free in Alberta: 310 FARM (310-3276)

Medical Clinic: _____

Hospital:_____

Veterinarian: _____



Personal Protective Equipment

Personal protective equipment (PPE) is designed to protect you from injury and illness. In a poultry coop/barn, PPE includes safety mask and respirators, ear plugs and muffs, safety goggles and glasses, rubber or steel-toed boots, long sleeved overalls, hair net and plastic gloves. To decrease the risk of bringing bacteria, bugs and disease from your flock into your home, have boots dedicated for the chicken house. Place clean boot washes at the entrance of your coop, wash your hands and wear personal protective equipment when dealing with your poultry flock.

Chickens make a lot of dust, noise and odours. Your flock size will determine the level of all these factors. Dust can harbour many pathogens that can negatively affect your health. If you have prolonged exposure to dust, you can develop respiratory problems later in life. By wearing personal protective equipment such as a face mask, you can protect yourself from developing respiratory problems.

Moderate levels of ammonia pose a respiratory hazard for workers and can irritate the eyes. High levels are very dangerous as ammonia will replace oxygen in the blood. Ensure good ventilation in the barn by regularly removing manure.

Chickens have sharp claws and beaks. These can injure anyone who comes into contact with chickens, including their owners. If someone is perceived as weak, chickens can turn on the individual and become aggressive. Roosters are especially prone to being aggressive. Children are at particular risk of injury. Never leave children unattended with chickens, regardless of flock size.

Boot washes are not effective without very careful management. Boot washes can become a reservoir for bacteria and diseases.

For more information on ammonia and dust hazards, see: http://www.agriculture.alberta.ca/farmsafety

Conclusion

You should now be able to protect your family from food-borne illnesses from live poultry and poultry products. By following the five steps outlined in this module, you can likely prevent most food-borne illness.

The next and final module focuses on the safety of your chickens and what you can do to reduce any potential threats. It also provides guidance on euthanasia and safe disposal of dead chickens.

Use the following checklist to assess how well your animal and food handling practices protect you and your family.

Checklist

- ❒ I am aware of the common food-borne pathogens and understand how to protect my family from the illnesses caused by these pathogens.
- ❒ I follow the five steps to shop, prepare, store, cook and serve poultry products to prevent illness.
- ❒ I have posted a list of emergency numbers at the door of the poultry coop or barn.

Module 10

Safety for Your Chickens (Biosecurity)

Objectives

After you have completed this module, you will be able to:

- Prevent threats from wild animals and birds
- Reduce the risk of disease transmission from one bird to another and from people on the farm and visitors
- Keep records in case of emergency or disease outbreak
- Dispose of dead birds and euthanize birds in a safe and humane manner.

In the previous module, you looked at how to keep your family safe from diseases and food-borne illness from poultry and poultry products. This module focuses on safety of your flock.

Although much of the material in this module has been covered or touched on in other modules, this module brings together the biosecurity issues into one concluding module.

There are a number of potential threats that can compromise your flock. Pets, wild and domestic animals, and people may spread disease to your chickens. The word that commercial poultry owners use when referring to securing their livestock from these types of threats is “biosecurity.”

Biosecurity refers to practices designed to prevent, reduce and eliminate the introduction and spread of disease.

Location of Chicken Coop

Ideally, the location of your chicken coop or farm should be away from other farms and backyard operations. Put up gates and signage to let others know that your property contains birds. The gates protect your birds from intruders and also prevent the spread of disease by vehicles, bicycles and foot traffic. If you let other bird owners know you have birds on your property, they can take steps to prevent contaminating your birds with any disease agent they may be carrying from their birds on their clothes and boots.

Predators

If domestic or wild animals see your farm as a food source, there is a higher risk of the spread of disease. Wild animals that pose as threats to your farm can include skunks, weasels, wolverine, mice, squirrels, foxes, coyotes, cougar, lynx, grizzly and black bear. Wild birds that pose a threat to your farm include pigeons, robins, chickadees, blue jays, crows, ravens, falcons, eagles, hawks, owls, geese and ducks.

To avoid attracting unwanted guests:

- Promptly clean up any spilled feed and litter.
- Keep food in sealed containers.
- Prevent foreign entry by fortifying your coop and thereby protecting your chickens from underground, air and ground level entries. If left unchecked, predators, pests and wild birds will find ways into the chicken coop/barn.
- Store any dead animals in a sealed container until they are disposed of according to provincial and municipal regulations.
- Collect and store eggs daily; dispose of garbage and any broken/waste eggs appropriately.

Owners and Their Families

As an owner, you can protect your flock by taking the following precautions:

- Regularly wash your hands before and after entering any poultry housing units.
- Designate a change of clothes and boots specific to farm work.
- Wear appropriate safety gear such as face mask, hairnet and goggles.
- Thoroughly wash any egg collecting trays, baskets, trays, feed and water containers, cages and tools.
- Provide non-mouldy food and clean water daily.
- Provide fresh bedding and nest box materials weekly.
- Promptly remove and dispose of any dead birds and soiled litter according to municipal bylaws.
- Remove and dispose of any cracked or dirty eggs that will not be used.

Visitors to Your Coop

- Maintain a visitor log book that records contact information and the purpose for the visit.
- Record the following information: if a visitor has been in contact with other birds, including their own, in the last 72 hours and if they own their own birds or have any allergies, such as dust.
- Provide protective gear including booties, facial masks, hair nets, plastic gloves and clean coveralls for any visitors who enter the poultry premises.
- To reduce the risk of spreading disease, avoid borrowing from or sharing equipment with other bird owners.
- Use your own tools and thoroughly sanitize and disinfect before using.

Recognize and Report Disease

Keep records of all incoming birds on your farm and breeder contact information. If a bird gets sick, record the date, signs of disease and age of the bird. For traceability purposes, keep a logbook of all visitors on your farm.

Example Signs of a Sick Bird

Signs to look for include lack of energy, movement or appetite, coughing, gasping, sneezing, lack of coordination or tremors, diarrhea, pale combs and wattles, swelling around neck, eyes and head, or sudden death. See Figure 10-1 Sick Chicken.

Figure 10-1 Sick Chicken

Provincially Reportable Diseases

If you suspect or have a confirmed reportable disease, you must report it to the Office of the Chief Provincial Veterinarian within 24 hours: at 780 427-3448 or toll-free by first dialing 310-0000. After business hours, call 1 800 524-0051.

See Module 8 for a list of provincially reportable diseases.

Separate Sick, New or Returning Birds

Remove sick birds from your flock and quarantine them as described below. For any new and returning birds, keep separate from the flock, and quarantine them until it is safe to reintroduce them. Follow the procedure below for quarantining your birds.

Quarantine

A quarantine zone is a location on your property that is separate from the main flock. If you have a small yard, your quarantine zone could be a section of your garage or on the opposite side of the property. If you do have a larger yard, a minimum distance is 30 feet. See Figure 10-2 Quarantined Chickens.

Figure 10-2 Quarantined Chickens

To decrease the risk of introducing a disease to your flock, monitor the quarantined birds for 30 days and watch for any signs of sickness before placing birds with the flock. If no signs of sickness are detected, place the birds in a separate pen that enables quarantined chickens to be seen by the others in the flock. Keep them separate for a week within eyesight of other chickens before releasing them. This allows the rest of your flock to become accustomed to the new birds.

Record Keeping

Record keeping is a critical part of biosecurity. Keep records of supplies purchased, management techniques, veterinary reports and customers. These records are necessary in case of emergency, food recall, disease outbreak or food safety issues. See Figure 10-3 Record Keeping.

Figure 10-3 Record Keeping

Example **Types of Emergencies or Food Recalls**

Emergencies can include fire, flooding, theft or equipment failure. Food recalls can include poultry products as well as poultry feed. This can be due to contamination on premises or a food-borne illness.

Records to Keep

Use the following checklist to ensure you are keeping records that are necessary in the case of a disease outbreak, such as avian influenza. This information can help the investigation.

- ❒ Flock records (e.g., number and type of birds, mortality, production, feed and water intake)
- ❒ Veterinary records and laboratory reports
- ❒ Detailed description of farm management practices
- ❒ Records of purchase/sale of feed, poultry, etc.
- ❒ Movement on and off the premises during the past 21 days (e.g., feed trucks, power, gas)
- ❒ Farm visitor logbooks
- ❒ Site map of the farm
- ❒ Contact information for the farm veterinarian.

Educate Yourself

Keep yourself up to date on health and safety concerns and the latest biosecurity practices. Educate employees, family members and neighbours. Create a culture of health and safety on your property. Ensure easy access to protective gear such as face masks, plastic gloves, hairnet, designated work boots and work clothing.

For a short video on keeping diseases out of your flock, go to:

http://www.inspection.gc.ca/animals/terrestrial-animals/biosecurity/tools/video/eng/1320092234079/1322158553549

http://www.inspection.gc.ca/animals/terrestrial-animals/biosecurity/tools/eng/1344790074044/1344790183249

Mortality

Alberta designates five ways to safely dispose of dead chickens: burial, incineration, composting, rendering and natural disposal. The Alberta government has a guide that includes a decision-making tree to help you decide which method of disposal.

For a guide to disposal of dead chickens, go to:
http://www.agric.gov.ab.ca/livestock/poultry/mortality.pdf

If you suspect that the chicken died of an infectious or reportable disease, contact your veterinarian.

If you suspect or have a confirmed reportable disease, you must report it to the Office of the Chief Provincial Veterinarian at:
780 427-3448 or toll-free by first dialing 310-0000.
After hours: 1 800 524-0051

To contact the Canadian Food Inspection Agency, go to:
http://www.inspection.gc.ca/english/anima/disemala/rep/repe.shtml

For more information on composting techniques, go to page 44 of
http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex8875

Help for Diagnosing and Treating Disease

Alberta Agriculture and Forestry (AF) has developed a program that aims at helping small flock non-quota holding farmers to diagnose and treat disease. When mortality occurs and disease is suspected, chicken owners and their veterinarians can drop off birds at one of four labs located in Fairview, Edmonton, Airdrie and Lethbridge. There, birds will undergo a post-mortem examination.

For more information on post-mortem examinations, contact AF's veterinary pathologist at 403 948-8536.

Figure 10-4 Dead Chickens

For more information on acceptable euthanasia methods, go to AVMA Guidelines for the Euthanasia of Animals: 2013 Edition

https://www.avma.org/kb/policies/documents/euthanasia.pdf

Euthanasia

When you work with chickens, you may have to euthanize one or more of them. Euthanasia is a means to minimize suffering of a bird by bringing death quickly. Veterinarians can perform this procedure, but there may be times where a veterinarian is not available or euthanasia must be performed immediately to end suffering. As a bird owner, it is your responsibility regarding the birds' welfare and well-being to ensure euthanasia is performed effectively and humanely.

Methods of euthanasia that are unacceptable for poultry include: carbon monoxide from vehicle exhaust, drowning, suffocation, using brute force such as striking the animal against an object, using unapproved inhalants such as chloroform, or allowing the suffering animal to just die.

For a step-by-step guide, go to: http://www.chickenfarmers.ca/wp-content/uploads/2014/05/CFC-Euthanasia-Guidelines.pdf

Conclusion

This module wraps up some of the biosecurity steps you should take to prevent threats from predators, reduce the risk of introducing diseases in your flock and reduce the risk of disease transmission from other birds and people. You should also be able to keep good records should there be an emergency or disease outbreak and know how to euthanize and dispose of dead birds.

Use the following checklist to assess your biosecurity practices.

Checklist

- ❒ I have located and designed the chicken coop to reduce the risk of predators.
- ❒ I have taken steps to reduce the risk of disease transmission from both family and visitors.
- ❒ I know the provincially reportable diseases and to whom to report these diseases.
- ❒ I quarantine sick and new animals.
- ❒ I keep good records of my flock including population, production, purchases and visitors.

Resources

Local Poultry Resources

Breeders

Extensive list found on http://www.canadianheritagebreeds.com/standard-chickens.html

Location	Name	Vaccinations	Breeds	Contact
Edmonton, Alberta	Poultry Research Centre	Marek's Disease, Infectious Bronchitis	Rhode Island Red, Barred Plymouth Rock, Light Sussex, Brown Leghorn, New Hampshire, White Leghorn	https://heritagechickens.ca/
Westlock, Alberta	Rochester Hatchery	Marek's disease, Coccidiosis	Extensive list: see website	www.rochesterhatchery.com
Bashaw, Alberta	Hawthorne Hatchery	Infectious Lung T	Chanteclers Rose Comb Rhode Island Reds Cochins, Orpingtons	http://www.hawthornhillpoultry.com/

On-Farm Nutritionists

Company	Contact	E-Mail	Phone
Landmark Feeds	Tracy Spears	t.spears@nutreco.ca	1 204 988-1719
DSM	Doug Tiege	doug.teitge@dsm.com	1 403 348-7150
Country Junction Wetaskiwin	Nancy Fischer	nfischer@wetaskiwincoop.com	1 800 729-9155
Champion Feeds	Darren Lidberg	Darren@championfeeds.com	1 780 349-5886
Master Feeds	Michael Schalm		1 800 665-0394
Poultry Nutrition Partners	Shawn Fairbairn	shawn.fairbairn@poultrypartners.ca	1 306 715-1155
Hi-Pro	Peter Klita	peter.klita@hiprofeeds.com	1 780 449-5850
	Art vanZanten	art.vanzanten@hiprofeeds.com	
Steinbeck Feed and Hatchery	Perry Kaita	pkaita@steinbach-hatchery.com	1 204 371-6231
Friesen Livestock	Vic Pouteaux	vic.pouteaux@friesennutrition.com	1 403 928-7030
Cargill	Mark Nelson	mark_nelson@cargill.com	1 403 329-0787
EMF Nutrition	Craig Garand	cgarand@emf-nutrition.com	1 306 955-4665
	Charles Qin	cqin@emf-nutrition.com	
New-Life Mills	Jassen Jackman	jjackman@newlifemills.com	1 403 359-5440
Co-Op Feeds	Gemunu Widyaratne	g.widyaratne@fcl.ca	1 306 649-5134
RAC Nutrition	David Laurin	dlaurin@racnutrition.ca	1 519 725-1717

Veterinarians Specializing in Poultry (small flocks)

Clinic Location	Name	Phone #	Vet
Barrhead	Barrhead Vet Clinic	780 674-5335	
Devon	Devonian Veterinary Clinic	780 987-5780	Dr. Onderka
Onoway	Onoway Veterinary Clinic	780 967-2967	
Sangudo	Sangudo Veterinary Clinic	780 785-2200	
Sherwood Park	Uncas Veterinary Clinic	780 922-5447	Dr. Eryn Hanak, Dr. Leslie-Anne Smith
Leduc	Leduc Veterinary Hospital	780 986-3269	Dr. Steve Radostits
Wetaskiwin	Wetaskiwin Animal Clinic	780 352-7006	

Processing Plants

Location	Name	Phone #	Type
Pigeon Lake	Pigeon Lake Processing Plant	780 682-3883	Plant
Irricana	Tschetter Colony	403 935-2362	Plant

Alberta websites

http://www.poultry.ales.ualberta.ca/

Poultry Research Centre

The Poultry Research Centre (PRC) is an internationally recognized collaborative R&D and learning hub formed in 1986. The PRC is located on the University of Alberta Farms, South Campus in Edmonton. It is also a unique partnership between the University of Alberta, Alberta Agriculture and Forestry, and the poultry industry. The PRC consists of an interdisciplinary team of scientists who conduct research aimed at benefiting egg and poultry producers, food processors and manufacturers, functional food and nutraceutical industries.

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3897#poultry

The Government of Alberta's site delivers up to date information on legislation, biosecurity practices, basic guidelines on small flock owners, manure management and marketing strategies.

http://www.eggs.ab.ca

Egg Farmers of Alberta is a not-for-profit organization that provides the promotion, control and regulation of the marketing of eggs in Alberta.

http://www.chicken.ab.ca/

Alberta Chicken Producers is a farmer-run organization that provides the promotion, control and regulation of the marketing of chicken in Alberta.

http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/All/apa6620

Market Sales Rules and Regulations Alberta Government

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex14045

Market Sales Eggs - Farm Direct Marketing Eggs: What you need to know.

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/acts6183

Marketing of Agricultural Products Acts and Regulations

http://www.agric.gov.ab.ca/app21/programsservices

Alberta Government programs and services such as agriculture loans and grants, information centres, training and education resources.

http://www.agric.gov.ab.ca/flippingbook/agdex/450_29-1/html/index.html

Poultry Mortality Composting

http://www.abvma.ca/biosecurity/SmallFlock.asp

Safety and biosecurity measures for small flock owners in Alberta.

http://www.agric.gov.ab.ca/livestock/poultry/mortality.pdf

Disposal methods – What to do with poultry carcasses

http://www.agric.gov.ab.ca/app19/calc/livestock/waterreq_dataentry1.jsp

Calculate water intake by using livestock calculator.

http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/epw10940

Air quality

http://www.growingforward.alberta.ca/cs/groups/growing_forward2/documents/document/bnqt/mjy0/~edisp/agucmint-264479.pdf

List of light bulb comparisons

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex14045

How to market the sale of eggs in Alberta.

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/pou3653?

Disinfection and cleaning guide

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex8875

Manure Composting Manual, Alberta Government

http://www.agric.gov.ab.ca/flippingbook/agdex/450_29-1/html/index.html

Poultry mortality

Online Resources

There are many online resources that a poultry enthusiast, small flock owner and urban farmer can use to ensure stronger biosecurity practices and safer food management techniques. Within this list, there are many Alberta sites.

Government Websites

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex3897#poultry

The Government of Alberta's site delivers up to date information on legislation, biosecurity practices, basic guidelines on small flock owners, manure management and marketing strategies.

http://www.gov.mb.ca/agriculture/livestock/production/poultry/index.html

The Government of Manitoba supplies small flock owners with information on feed and nutrition, and management guides based on temperature, lighting and air quality.

http://www.agriculture.gov.sk.ca/Livestock-Poultry

The Government of Saskatchewan provides fact sheets on brooding and rearing, nutrition, water, marketing and mortalities.

http://www.al.gov.bc.ca/poultry/

The Government of British Columbia has developed a resource list for small flock owners. It includes information on disease prevention, basic care for chickens, and management guides on dust, manure and odour, as well as marketing strategy guides.

http://www.omafra.gov.on.ca/english/livestock/index.html

The Government of Ontario presents chicken information separated into categories of broiler, breeder and layers. They have in depth information on disease prevention, feed nutrition and small flock management.

http://www.poultrycrc.com.au/

Australia's poultry site is designed to help improve poultry management, food safety and biosecurity practices. The site includes: education resource materials, feed evaluation and nutritional information, poultry science journals and articles.

Legislative Bodies

http://www.inspection.gc.ca/

Canadian Food Inspection Agency enforces legislative acts to ensure food safety, meat and egg quality.

http://www.eggs.ab.ca

Egg Farmers of Alberta is a not-for-profit organization that provides the promotion, control and regulation of the marketing of eggs in Alberta.

http://www.chicken.ab.ca/

Alberta Chicken Producers is a farmer-run organization that provides the promotion, control and regulation of the marketing of chicken in Alberta.

http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/All/apa6620

Market Sales Rules and Regulations Alberta Government

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex14045

Market Sales Eggs - Farm Direct Marketing Eggs: What you need to know.

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/acts6183

Marketing of Agricultural Products Acts and Regulations

http://www.chickenfarmers.ca

Chicken Farmers of Canada (CFC) monitors compliance with provincial quota allocations, ensuring that each province in Canada raises as much chicken as they have agreed to.

Urban Community Organizations

Cluck Canada Liberated Urban Chicken Klub https://www.facebook.com/CLUCKCanada

River City Chickens http://www.rivercitychickens.org/

Programs and Services

http://www.agric.gov.ab.ca/app21/programsservices

Health, Nutrition and Disease Management

http://www.merckmanuals.com/vet/poultry.html

This in-depth site is used by veterinarians and provides detailed analysis of poultry diseases and nutritional information, as well as examples of vaccination programs.

http://www.thepoultrysite.com

ThePoultrySite is an international poultry website that offers articles and research on poultry related topics from all over the world. The site includes:

- Quick reference guide to 140 common poultry diseases as well as treatment options
- Egg grading and washing
- Quick guide to biosecurity practices (including checklist)
- Poultry news articles.

http://www.canadianpoultry.ca/

Online Canadian resource on disease prevention of poultry and health management guides of the flock.

Poultry Education, Articles and Resources

http://www.poultryindustrycouncil.ca

Based out of Guelph, Ontario, the Poultry Industry Council is a non-profit organization that offers educational resources and research.

http://www.nutrecocanada.com

Nutreco Canada provides research information on subjects such as pecking, cannibalism, biosecurity, egg formation, egg quality, management of heat stress and water supply.

http://www.ag.auburn.edu/nptc

Auburn University National Poultry Technology Centre researches for better efficiency in the poultry industry with articles on ventilation, insulation and environmental controls.

https://attra.ncat.org/attra-pub/poultry

The National Sustainable Agriculture Information Service website provides information on alternative poultry production systems and outdoor access.

http://en.engormix.com/MA-poultry-industry

Technical articles, forums, links and professional contacts to answer any poultry related questions.

http://www.sare.org

An American Organization known as the Sustainable Agriculture Research & Education (SARE) which provides articles, resources and education materials on sustainable ways to raise chickens.

American Extension Poultry

Each extension site provides publications such as management guides for small backyard flocks, mortality and manure management, poultry housing tips, food handling safety measures, egg quality guidelines and more.

http://www.extension.org/poultry

University of Missouri

http://pubs.ext.vt.edu/category/poultry.html

Virginia Cooperative

http://poultry.ces.ncsu.edu

North Carolina State

http://extension.psu.edu/animals/poultry

Penn State

http://www.extension.umn.edu/agriculture/poultry

University of Minnesota

http://extension.uga.edu/agriculture/animals/poultry/
University of Georgia

http://extension.umd.edu/poultry
University of Maryland

http://fyi.uwex.edu/poultry/
Wisconsin Poultry

E-Book

https://archive.org/stream/The_Chicken_Health_Handbook_Complete/
Chicken Health Handbook

http://www.poultry.uga.edu/courses/ps202lr4/sld001.htm
Complete Anatomy of a Chicken

http://www.agric.gov.ab.ca/flippingbook/agdex/450_29-1/html/index.html
Poultry Mortality Composting

Flock Manuals

Alberta
http://www.abvma.ca/biosecurity/SmallFlock.asp

British Columbia
Small Flock Poultry Health Manual http://www.agf.gov.bc.ca/ahc/poultry/small_flock_manual.pdf

Yukon
http://www.emr.gov.yk.ca/agriculture/pdf/Poultry_Health_Handbook_final.pdf

Canada
http://www.nfacc.ca/pdfs/codes/poultry_layers_code_of_practice.pdf

http://www.agr.gc.ca/misb/aisd/poultry/pub1757e.pdf

http://en.aviagen.com/assets/Tech_Center/Ross_Broiler/Ross-Broiler-Handbook-2014i-EN.pdf

http://www2.ca.uky.edu/poultryprofitability/production_manual.html

http://www.spottedcowpress.ca/PoultryHomeStudy.pdf

http://www.hylinena.com/UserDocs/products/Lohmann_Alternative_System.pdf

http://www.extension.umn.edu/food/small-farms/livestock/poultry/rearing-chicks-and-pullets-for-the-small-laying-flock/

Magazines

Canadian Poultry

http://www.canadianpoultrymag.com

Small Farm Canada

http://www.smallfarmcanada.ca

World Poultry

http://www.worldpoultry.net/

Webinars

Everything poultry

http://www.extension.org/pages/66284/upcoming-webinars-for-small-and-backyard-poultry#.VEV8MxYZHqc

Winter

https://connect.extension.iastate.edu/p4eg5cv96lq/?launcher=false&fcsContent=true&pbMode=normal

Lighting

https://connect.extension.iastate.edu/p7k8epk4pbz/?launcher=false&fcsContent=true&pbMode=normal

Videos

Basic necessities for raising chicks

http://www.extension.umn.edu/food/small-farms/videos/

http://www.tractorsupply.com/know-how_Chicken-Care_how-to-care-for-new-baby-chicks

Includes 3 videos that will help prepare for raising chicks. Each includes a subscript for the film. Moving Pullets (growing chickens) into coop http://victoryfarm.org/entry/movingpullets.html

Raising Poultry For Profit

http://www.extension.org/pages/68226/video-raising-poultry-for-profit:-small-scale-production#.VEq5CBYZHqc

Decision Trees

Whether you should load your bird or not.

http://www.poultryindustrycouncil.ca/education2/transport-decision-tree/decision-tree/

Disposal methods – What to do with poultry carcasses

http://www.agric.gov.ab.ca/livestock/poultry/mortality.pdf

Chicken Breeds Reference Guide

http://albc-usa.etapwss.com/images/uploads/docs/pickachicken.pdf-livestockconservancyofcanada

Chicken Behaviour

http://www.extension.org/pages/66175/normal-behaviors-of-chickens-in-small-and-backyard-poultry-flocks#.VE_Eqhbsqc4

Breed Types

http://www.livestockconservancy.org/index.php/heritage/internal/chicken-chart

Raising Birds for Meat

http://www.extension.org/pages/69066/raising-meat-chickens-in-small-or-backyard-flocks#.VEgEuRYZHqc

http://pubs.ext.vt.edu/2902/2902-1083/2902-1083_pdf.pdf

Planning a Business

Broiler Industry

http://www.agf.gov.bc.ca/busmgmt/bus_guides/chicken_guide.htm

Budgeting

http://www2.ca.uky.edu/smallflocks/Management-budgeting.html

Feeds and Nutrition

Supplying the right feed is one of the keys to a healthy, productive small flock of chickens. The nutrients and feed ingredients must be matched to the age and type of bird being raised.

http://www.gov.mb.ca/agriculture/livestock/production/poultry/

http://extension.uga.edu/publications/files/pdf/C%20954_3.PDF

http://www.extension.org/pages/69065/feeding-chickens-for-egg-production#.VDQRthZIz4I

http://extension.usu.edu/files/publications/publication/AG_Poultry_2008-02pr.pdf

http://ir.library.oregonstate.edu/xmlui/bitstream/handle/1957/17469/pnw477.pdf?sequence=1

http://www.gov.mb.ca/agriculture/livestock/production/poultry/poultry-rations-and-feeding-methods.html

http://canadianbio.com/category/products/animals/chicken/

http://www.aces.edu/pubs/docs/A/ANR-1317/ANR-1317.pdf

Water

Calculate the amount of water your livestock needs through Alberta Government's handy calculator
http://www.agric.gov.ab.ca/app19/calc/livestock/waterreq_dataentry1.jsp

What to look for after having your water tested
http://www.poultryindustrycouncil.ca/pdfs/factsheets/fs_111.pdf

Article on water sanitation
http://www.thepoultrysite.com/articles/3201/poultry-water-line-sanitation –

Extension water requirements
http://www.extension.org/pages/68305/water-requirements-of-poultry#.VEfQIxYZHqc –

Nutrition specialist advises on water quality
http://www.nutrecocanada.com/docs/shur-gain---specialty/water-quality-for-poultry.pdf

Government of Saskatchewan examines water consumption in poultry per day, quality standards, as well as treatment options http://www.agriculture.gov.sk.ca/5603-Leaf

Temperature

http://gov.mb.ca/agriculture/livestock/production/poultry/brooding-temperatures-for-small-poultry-flocks.html

http://www1.agric.gov.ab.ca/$Department/deptdocs.nsf/all/epw10940

Brooding

http://www.gov.mb.ca/agriculture/livestock/production/poultry/brooding-temperatures-for-small-poultry-flocks.html

Coop/Chicken Housing

http://www.cps.gov.on.ca/english/po5000/poultry.htm

http://pubs.ext.vt.edu/2902/2902-1092/2902-1092.html

http://www.dummies.com/how-to/content/how-to-make-chicken-coop-blueprints.html

http://www.backyardpoultrymag.com/everything-you-need-to-know-about-chicken-coop-roosts/

http://pubs.ext.vt.edu/2902/2902-1092/2902-1092.html

http://www.dummies.com/how-to/content/how-to-make-chicken-coop-blueprints.html

http://www.dummies.com/how-to/content/anatomy-of-a-garden-chicken-coop.html

http://www.ces.ncsu.edu/depts/poulsci/tech_manuals/cage_free/poultry_houses.pdf

http://www.agf.gov.bc.ca/resmgmt/publist/Leaflets/Poultry/341-02.pdf

Ventilation

http://www.extension.org/pages/66115/ventilation-in-housing-for-small-and-backyard-poultry-flocks#.VEqiRRYZHqc –

http://www.thepoultrysite.com/articles/2321/key-factors-for-poultry-house-ventilation

http://www.omafra.gov.on.ca/english/livestock/poultry/facts/huffman.htm

Insulation

http://www.extension.org/pages/66118/insulation-of-housing-for-small-and-backyard-poultry-flocks#.VEBCcBYjSNc

http://www.naima.org/insulation-knowledge-base/residential-home-insulation/how-much-insulation-should-be-installed.html

Ammonia

http://www.joneshamiltonag.com/jh/wp-content/uploads/2013/05/Accurately-Measuring-Ammonia-Levels-in-Poultry-Houses-FINAL.pdf

http://www.avitechnutrition.com/pdf/technical-bulletin/2012/Bulletin-Jan.pdf

Lighting Programs

Government of Alberta list of light bulb comparisons
http://www.growingforward.alberta.ca/cs/groups/growing_forward2/documents/document/bnqt/mjy0/~edisp/agucmint-264479.pdf

Maine University article on poultry lighting
http://umaine.edu/publications/2227e/

Specific lighting tips for layers
http://www.poultry.uga.edu/extension/tips/documents/byfmar07.pdf

List of lighting characteristics for poultry barns and explanation of light types
http://www.omafra.gov.on.ca/english/engineer/facts/06-009.htm

Government of Saskatchewan: example of lighting programs
http://www.agriculture.gov.sk.ca/5602-Leaf

Government of Manitoba meat bird lighting program
http://www.gov.mb.ca/agriculture/livestock/production/poultry/pubs/bba01s06.pdf

Light conversion calculator
http://www.rapidtables.com/calc/light/fc-to-lux-calculator.htm

Hyline lighting program
http://www.hyline.com/aspx/redbook/redbook.aspx?s=4&p=23

Vaccinations

Overview of how small flock owners can vaccinate birds
http://edis.ifas.ufl.edu/ps030

http://www.poultryhub.org/health/health-management/vaccination/

http://avecast.com.br/wp-content/uploads/2013/01/THE-USE-OF-VACCINATION-IN-POULTRY-PRODUCTION.pdf

http://en.engormix.com/MA-poultry-industry/health/articles/vaccines-in-poultry-t2207/165-p0.htm

Example of a Vaccination Program

http://www.merckmanuals.com/vet/poultry/nutrition_and_management_poultry/vaccination_programs_in_poultry.html

Disease Charts/Quick Guides

http://www.lahinternational.com/clientuploads/pdf/PoultryAnatomyEng_w.pdf

http://www.poultryindustrycouncil.ca/pdfs/SOP.pdf

http://edis.ifas.ufl.edu/ps044

http://cpif.org/wp-content/uploads/2014/04/Booklet-Poultry-Diseases-interactv-1-copy.pdf

Disinfections/Product Guides

http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/pou3653?

http://www.agbiosecurity.ca/healthybirds/fckeditor/editor/filemanager/connectors/aspx/healthybirds/userfiles/file/3_4%20Introduction%20to%20disinfectants.pdf

http://www.poultryindustrycouncil.ca/pdfs/factsheets/fs_157.pdf

http://bam.naccvp.com/?u=country&p=msds

Biosecurity

http://www.agbiosecurity.ca/aspx/public/information.aspx#poultry

http://www.nutrecocanada.com/docs/shur-gain---specialty/biosecurity-for-small-poultry-facilities.pdf

http://www.inspection.gc.ca/animals/terrestrial-animals/diseases/bird-health basics/eng/1323643634523/1323644740109

http://www.thepoultrysite.com/articles/3219/poultry-disease-prevention-checklist

http://www.thepoultrysite.com/articles/3150/biosecurity-basics-on-poultry-farms

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University of Florida provides nutritional information, disease symptoms and prevention tips for small flock laying hens.

http://edis.ifas.ufl.edu/pdffiles/PS/PS02900.pdf

Virginia State University provides advice on how to prevent and troubleshoot egg eating habits.

http://pubs.ext.vt.edu/2902/2902-1096/2902-1096_pdf.pdf

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https://soundcloud.com/happyeggs

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http://www1.agric.gov.ab.ca/$department/deptdocs.nsf/all/agdex14045

Canadian Food Inspection Agency provides egg manual containing information on egg washing, structure of the egg, microbiology and factors for egg quality.

http://www.inspection.gc.ca/food/eggs-and-egg-products/manuals/shell-egg/chapter-18/eng/1375380670241/1375380672147

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Glossary

Avian influenza: a high risk disease because it is highly infectious. Birds with AI undergo high mortality, a severe drop in quality and quantity of egg production (eggs may lack shells), poultry products are closed to export markets and culling of the flock is mandatory to stop the spread of the disease.

Bell drinker: circular water dish shaped in a bell that can be air suspended.

Biosecurity: refers to practices designed to prevent, reduce and eliminate the introduction and spread of disease.

Broiler breeder: The parent stock of broilers. A broiler breeder bird lays fertile eggs that are collected and the eggs are hatched and raised for meat.

Broiler: a bird (chicken) that is raised for meat; also known as a meat bird.

Brooder: designated enclosure to raise baby chicks. Brooder setup includes heat lamp, plastic tote or wooden box, shavings, chick waterer and feeder.

Broody: a state of readiness to sit on and hatch eggs.

Campylobacter jejuni: bacteria that causes the illness, campylobacteriosis. Poultry can carry the disease without becoming ill but campylobacter jejuni can spread from animals to humans through close contact with infected animals, improper food handling and hygiene practices such as not washing hands before eating food after handling dirty eggs, litter and live birds. An infected person may undergo abdominal pain, vomiting, diarrhea and fever.

***Cocciodiosis*:** parasite that causes chickens to lose weight, have bloody feces and high mortality rate.

Community supported agriculture: this is a joint venture with consumers and producers as the consumers pledge support to a local farm to periodically receive produce. In addition to the produce, producers will add dairy and meat products if available.

Coop: a type of housing structure to shelter poultry; also known as chicken house or hen house.

Cloaca: an opening that excretes manure and urinary acid and eggs. This opening is also used during mating.

Clostridium perfringens: a bacterium that is found in the environment, especially in soils, sewage and dust. The bacteria affect the gut and tend to cause symptoms such as bloating, increased gas, diarrhea and nausea.

Crumble (medium-sized feed): type of feed form, crumbled pellets.

Cup drinker: cup-shaped drinking system.

Danger zone: temperature range (4^0 to 60^0 C) that food bacteria can grow and possibly contaminate food.

Disinfectant: agent applied to non-living object to kill microorganisms that may pose a risk to chickens.

Droppings board: board used to catch droppings underneath roost.

Dual purpose birds: larger in stature and lay eggs. Because of their larger bodies, they are also good for meat after they have laid eggs.

Dust bathing: a grooming behaviour. Chickens will roll around in dirt or shavings to remove parasites and excess dirt from their bodies. This is a social behaviour; if one chicken begins to dust bathe, other chickens will join.

Ecto (external parasites): parasites that affect skin, feathers and scales.

Enrichment: to make improvements to the chicken's environment (e.g., straw bales filled with treats, dangling strings, dust bathing material).

***Escherichia coli* infection:** causes infection in chickens if large numbers gain entry to the bloodstream from the respiratory tract and intestine. It can lead to gross lesions and death in young poults.

Euthanasia: painless death, usually to end suffering of a bird.

Farm gate: an on-farm location where consumers may purchase and pick up their products from the producer.

Farm store: a store located on the farm property where product is produced.

Federal laws: laws created by the federal government.

Feed conversion ratio: when a chicken eats food, the percentage of the food that is turned into meat or egg. If a feed conversion ratio is poor, there may be an imbalance in the feed or possibly an infection or disease within the flock.

Finisher feed: feed designed for broilers (meat chickens) from 8 weeks of age until point of slaughter.

Food recall: the removal of unsafe products from the market (e.g., poultry feed, poultry by-products or poultry equipment).

Food-borne illness: illness that is a result of contact with contaminated meat and eggs.

Foraging: when a chicken searches its environment for food sources.

Frostbite: localized freezing of tissues or skin.

Gizzard: birds use their gizzards to grind their food. To do this, birds will swallow small rocks which will grind large particle food in the gizzard.

Graded eggs: an egg grader uses a light source to illuminate the egg's interior. This allows the grader to check for cracks, meat spots and blood spots. A grader also checks for the shape and weight of an egg. To sell commercially, eggs must be graded by a CFIA approved grader.

Grit: small or loose pieces of stone, rock or sand. Grit aids chickens with food digestion.

Grower feed: feed designed for pullets (chickens that have not begun to lay).

Hantavirus: Hantavirus is carried by some mice and may be transmitted through contact with their droppings. Most cases occur in the spring during cleaning when people may breathe in airborne particles.

Heritage breed: strains of birds farmers raised before the specific broiler and layer strains. The commercial industry has genetically selected a few strains to increase meat and egg yield. The heritage birds are slower growing birds and will lay fewer eggs than will the commercial breed of chickens. A heritage breed is not always a dual purpose bird.

Husbandry: the act of caring for and managing livestock.

Infectious bronchitis: highly contagious disease that can be spread through contact with infected equipment, feces and aerosol, and through ingesting contaminated feed, water and litter.

Infectious disease: a disease that can be transmitted between animals or people.

Infectious laryngothacheitis (ILT): a highly contagious respiratory disease caused by the herpes virus. The mild form of ILT symptoms include watery nostrils and eyes and a decrease in egg production. A severe form of ILT has symptoms such as severe coughing, mouth and beak may have traces of blood, and is accompanied with high mortality.

Layer: a bird (chicken) that produces eggs, also known as a hen.

Layer feed: designed for egg-laying chickens. Layer ration has a higher percentage of calcium to make egg shells strong. Layer feed should be fed to chickens at point of lay (after their first egg).

Listeria monocytogenes: bacterium that causes a food-borne illness in humans. Symptoms of listeria include flu-like symptoms such as fever and diarrhea, and also confusion and incoordination.

Litter: material used for bedding for chickens (e.g., wood shavings).

Lux: unit of measurement of light intensity (1 lux = 10 foot candles) illumination of a surface, one square metre away from a candle source.

Marek's disease: a disease caused by highly contagious alphaherpes virus. Symptoms include transient paralysis, early mortality syndrome, cytolytic infection, atherosclerosis and persistent neurologic disease.

Mash (finely ground feed): type of feed form, ground feed.

Mortality: death.

Moulting: chickens will cease laying and lose their feathers. This is a time where a chicken's reproductive system is given a rest to allow for a renewal of nutrients and healthy growth in body.

Municipal laws: laws specific to a municipality.

Mycoplasma synoviae: a chronic infection found in the upper respiratory tract.

Nest box: an area designated for chickens to lay eggs, tend to be box-shaped.

Nesting: the act of creating a nest or sitting on eggs by laying hens.

Newcastle disease: symptoms include sudden onset of hoarse chirps, watery discharge in nostrils, face swelling and paralysis.

Nipple drinker: a drinking system that supplies water to chickens through nipple-shaped waterers.

Notifiable diseases: Notifiable diseases are those which require monitoring for trade purposes or to understand their presence in Alberta, but no actions will be taken.

Omphalitis: bacterial infection of the yolk sac during hatch. Most chicks will die if infected with omphalitis in the first 48 hours, but can continue to die 2 weeks post.

Oyster shell: used as a supplemental calcium source for hens.

Pasty butt: when a chick's cloaca becomes clogged. Must be treated immediately (e.g., warm water on a cloth to remove feces from behind).

Pecking: chickens use their beaks to consume grains. They also will peck at other chickens, or as an exploratory behaviour.

Pellet (large-sized feed): type of feed form, compressed mash.

Personal protective equipment (PPE): equipment used to protect a person's body and health (e.g., face mask, coveralls, gloves, hairnet).

Pest: a plant or animal detrimental to your chickens (e.g., flies, rodents, beetles)

Photoperiod: the duration of light or day length.

Photostimulate: an increased day length initiates sexual maturation in birds. Birds when photostimulated will have bright red combs, act flighty and begin to lay eggs.

Preening: a grooming activity. Chickens use their beaks to groom themselves, adjusting their feathers and removing dirt particles.

Premises Identification (PID) Number: PID number is a required by all poultry owners under the *Animal Health Act*. This number helps trace animals, manage disease outbreaks and notify animal owners in emergencies.

Prolapse: when a hen's oviduct becomes exposed on the exterior of the body. This happens in laying hens.

Provincial laws: laws specific to a province.

Provincially reportable diseases: Reportable diseases are those which require action to control or eradicate because they are a threat to animal or human health, food safety or the economy.

Quarantine: isolating a sick or new bird from the rest of the flock (forced isolation).

Quota: the production goal of a specified product (chicken meat and table eggs). Quota is set by the Alberta Chicken Producers and the Egg Farmers of Alberta.

Roost: place where chickens will perch during the night (e.g., beam, plywood 16 inches or 40 cm above ground).

R-value: a number value given to insulation materials to evaluate insulation efficiency.

Salmonella: infection caused by eating undercooked poultry meat and touching live animals without proper hand washing.

Sanitation: the act of reducing pathogenic organisms so they do not pose a threat to the chickens (e.g., cleaning).

Scratch: grains (cracked or rolled oats, corn, barley, wheat) that are provided free-choice as a treat.

Spraddle legs: the result of a chick not able to have enough traction on floor materials (e.g., if using newspaper, chick is most likely to slip and develop spraddle legs).

Staphylococcus aureus: a bacterium that can be found in the mouth and nose of animals and people. It is commonly transferred to food by the food handler and later if the food is not properly refrigerated.

Starter ration: feed designed for growing chicks with high levels of protein.

Supply management: policies that regulate the price of dairy and poultry products in Canada. These policies are regulated by marketing boards. The marketing boards that regulate poultry products are the Hatching Egg Producers, the Alberta Chicken Producers and the Egg Farmers of Alberta.

Table eggs: eggs used for human consumption.

Ungraded eggs: eggs that have not been through a process of illumination of the inner egg by a light source.

Vaccination: the act of giving a vaccine to promote an immune response to a particular virus.

Ventilation: the act of replenishing indoor air with outdoor air to create a higher indoor air quality; need to ventilate poultry barns in both summer and winter.

Winterizing: preparing the chicken coop for winter.

Withdrawal times: time required for a drug administered to a chicken to pass through the system, so that no residue is remaining in the chicken meat or eggs.