

The Extraordinary Egg

Journey of the Egg From the Farm to Your Table



Follow the Journey

Here's the extraordinary story about eggs and the journey they take from the farm to your table. Find out how farmers care for their egg-producing hens and how measures are put into place to keep eggs safe. Learn about the grading process and how the best quality eggs end up in your refrigerator. Read about ongoing research being conducted to ensure that eggs continue to offer excellent nutrition. And, discover more about one of nature's most unique and nutritious foods. An excellent source of high-quality protein, eggs are part of *Canada's Food Guide to Healthy Eating* and an important part of the Canadian diet. Let's follow the egg's journey.

It All Starts at the Hatchery

At the hatchery, eggs from breeding flocks are placed in incubators. After 21 days, the eggs hatch and the chicks are housed in a pullet barn (a pullet is a young hen). At 19 weeks of age, the hens are transferred to a farm to begin producing eggs. Hens start laying eggs at about 19 weeks of age and continue for at least 12 months. The average laying hen can produce approximately 300 eggs in one year - that's about one egg every 1½ days. These eggs are not fertilized and therefore will not hatch into chicks; they are produced strictly for consumption.

Life on the Egg Farm

The egg's journey begins at the farm. Canada has approximately 1,100 registered egg farms. A typical egg farm has between 10,000 and 20,000 hens, although Canadian egg farms can range from several hundred to 400,000 hens. Overall, Canadian egg farmers care for a total of 19 million hens, producing approximately 450 million dozen eggs per year - that's 5.5 billion eggs! The egg industry's annual contribution to the Canadian economy is about \$410 million.

Canadian egg farmers treat their hens with care. Humane treatment of hens is a priority. Not only is it the right thing to do, but only healthy hens lay eggs, so it is in the farmer's best interest to take good care of the hens. The farmer makes sure that the hens have adequate light and air, a well-balanced, nutritious diet, fresh water and comfortable surroundings - all the essentials for health and production.

Heat, light and humidity are automatically controlled to provide year-round comfort for the hens. The hens' diet does not contain hormones or antibiotics, but plenty of grains, proteins, vitamins and minerals. Food and fresh water are constantly available. Farmers follow sound animal welfare practices based on a national code of practice and an animal care certification program.



Controlling the hens' environment



Hens in clean surroundings

Egg Production

Comfortable, Safe Housing

The cage system is the preferred housing system for today's egg production, ensuring the highest possible food safety and egg quality standards. Cages provide a safe, healthy environment for hens by maintaining a comfortable group size and keeping them safe from predators. Keeping 6 to 8 birds together in a cage supports their natural instinct to cluster together for security and makes for a calmer, less aggressive environment for the hens. Cages are designed to keep manure separate from the hens and the eggs, which is important for food safety because certain bacteria can pass through the thousands of pores in the shell into the egg.

Once upon a time, collecting eggs was almost hide and seek and the quality was just as unpredictable. In today's modern egg production, the eggs roll from the cages onto a conveyor belt leading to a central packing area. This process ensures prompt refrigeration. The eggs are placed in plastic, sanitized flats, 30 at a time, wide-end up to keep the yolk centred. The flats are then placed on pallets and stored immediately in a cool room that is chilled to 10° to 13°C (50° to 55°F). At this temperature, eggs retain their freshness and quality while awaiting shipment to a registered grading station.



Healthy hens



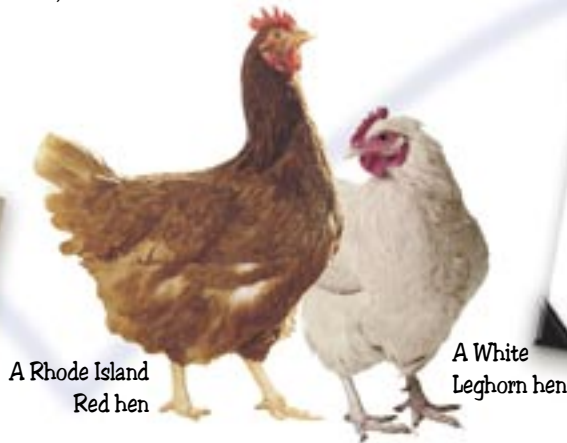
Eggs being collected



Eggs awaiting grading

High Standards

Farmers take great care to ensure that their eggs meet the high standards expected by Canadians. Food safety and cleanliness are important concerns on the farm. Egg farmers follow the *Start Clean - Stay Clean™* program, which is a national producers' program designed to ensure the production of safe, clean, high-quality eggs. This program has national standards that must be adhered to by farmers. Egg farms are inspected regularly to ensure farmers are following program regulations. Canadian eggs are among the cleanest and safest in the world. In Canada, it is estimated that only one in a million eggs contains Salmonella and, if the egg is thoroughly cooked, there is no risk of food poisoning.



A Rhode Island Red hen

A White Leghorn hen

Colour...What's the Difference?

The most common laying hen in Canada is the White Leghorn - a small bird that lays white eggs. The Rhode Island Red hen, which lays brown eggs, is another common breed. There are no nutritional differences between white and brown eggs.

The colour of the egg yolk is determined by the feed a hen eats. A hen that eats a wheat-based diet, which is more common in the western provinces, will produce eggs with pale yellow yolks, while a hen that consumes a corn or alfalfa-based diet produces eggs with dark yellow yolks.



The hens' feed

Egg Grading

In Transit

Our journey continues as the eggs are transported from the farm to the grading station. Maintaining the correct temperature is of utmost concern during transportation, so eggs in transit are kept in temperature-controlled trucks. If the temperature gets too warm, there is a possibility of bacteria growth and deterioration of the egg's quality.



Making the Grade

The next step in the journey is to the grading station where eggs are divided into three grades - usually within 24 hours of arrival. In Canada, all eggs sold in grocery stores have been cleaned, checked for quality, sized and packed at an egg grading station registered by the Canadian Food Inspection Agency (CFIA). CFIA inspects all registered egg grading stations, ensuring proper sanitation and operating conditions.

The grading process begins with flats of 30 eggs being lifted onto an assembly line. Metal arms with suction cups gently lift the eggs from the flats onto a moving

CANADA GRADE A

- sold in retail stores for household use
- the most commonly bought consumer egg
- firm white
- round, well-centred yolk
- clean, uncracked shell with normal shape
- small air cell (less than 5 mm deep)

CANADA GRADE B

- sold for commercial baking or further processing
- can be sold at retail
- watery white
- slightly flattened yolk
- uncracked shell possibly with rough texture
- may be slightly stained or soiled

track. The eggs are then washed and sanitized in a high-speed washer that gently scrubs the eggs. From here the quality of the eggs is examined using a process called *candling* or scanning. In candling, the egg passes over a strong light which makes the interior of the egg visible. This allows the grader to see the condition of the shell, the size of the air cell and whether the yolk is well-centred (a sign that the white is thick, because it is holding the yolk in its proper position). Using an electronic sensor, eggs are divided into three streams: Grades A, B and C. Below is what that grading system means:

CANADA GRADE C

- sold to commercial processors for further processing only
- thin, watery white
- loose yolk
- possibly cracked shell and up to 1/3 stained



Egg Producer Organizations: The Canadian Egg Marketing Agency (CEMA) is a farmer organization that manages the production and promotion of eggs in Canada. Each year, CEMA forecasts the national requirement for eggs - known as the national allocation or the national quota. CEMA ensures that there are enough eggs in supply to meet demand in Canada. Provincial egg organizations carry a similar role but at a provincial level. These are independent, self-governing farm organizations funded entirely by egg farmers - they are not government bodies or departments. CEMA and the provincial egg organizations ensure consumers get the safest, highest quality eggs, which have been produced using humane practices.

Poultry and Egg Research: Many university research centres across Canada conduct poultry and egg research. Some of the current research includes:

- Increasing the nutritional content of eggs (e.g. folic acid, lutein)
- Poultry welfare, with the goal of improving animal well-being
- Reducing or preventing osteoporosis in laying hens
- Developing environmental programs that improve poultry health, the health of poultry workers and the global environment

Egg Grading

Egg Anatomy

Air Cell

- formed at the wide end of the egg as it cools after being laid
- the fresher the egg, the smaller the air cell

Yolk

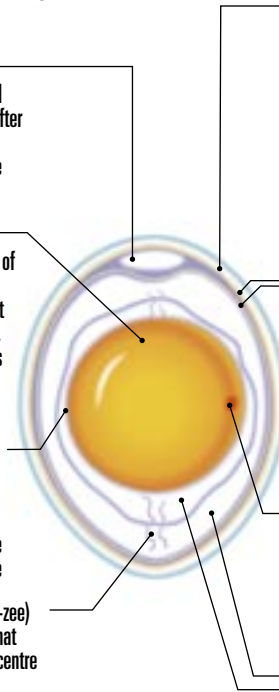
- the egg's major source of vitamins and minerals
- colour ranges from light yellow to deep orange, depending on the hen's food; nutritional value is similar

Yolk Membrane (Vitelline Membrane)

- surrounds and holds the yolk
- the fresher the egg, the stronger the membrane

Chalazae (chuh-LAY-zee)

- a pair of spiral bands that anchor the yolk in the centre of the thick albumen
- the fresher the egg, the more prominent the chalazae



Shell

- the egg's first line of defence against the entry of bacteria
- can be brown or white, depending on the breed of hen; nutritional value of the egg is the same
- approximately 10,000 tiny pores allow moisture and gases in and out

Shell Membranes

- the egg's second line of defence against bacteria
- there are two membranes on the inside of the shell: outer and inner
- one membrane sticks to the shell and one surrounds the albumen

Germinal Disk

- appears as a slight depression on the surface of the yolk
- the entry for the fertilization of the egg

Albumen (al-BYOO-min)

- albumen is the egg white
- there are two layers: thick and thin albumen
- mostly made of water, high-quality protein and minerals

How Big, How Long?

Each egg is then weighed electronically, separated by size and packaged in foam, fibre or clear plastic cartons. The cartons are stamped to indicate the *Best Before* date which lets you know how long the eggs will maintain their quality. This date is usually set at 35 days after grading.



PEEWEE
less than 42 g



SMALL
42 g to 48.9 g



MEDIUM
49 g to 55.9 g

Eggs are sized by weight. Eggs in a carton or flat might not be the same size, but they will be within a specific weight range. A hen lays very few peewee and small eggs, some medium and jumbo, and mostly large and extra large eggs. Several factors influence the size of an egg, the major one being the age of the hen - as the hen ages, her eggs increase in size. Because of availability and consumer preferences, not all sizes of eggs are found in every store.

Graders take great care to maintain optimum temperature and humidity levels of the eggs that reach their doors. Most eggs start at the washers and pass through the entire system in less than 15 minutes. After being packaged in cartons, fresh eggs are again refrigerated until they are sent to stores and restaurants within a few days.



Another Inspection, More Tests

Before the eggs are shipped, federal inspectors take random samples for individual testing to ensure the eggs are high quality. Once approved by the inspectors, the eggs are shipped to grocery stores in cartons and to restaurants and institutions in 2½-dozen flats. Even with all the careful washing, checking, grading and inspecting, the eggs you buy at the store usually arrive there within four to seven days of being laid.



An inspector examining eggs

Egg Choices

At the Store

The journey continues on to the grocery store where the eggs are refrigerated at 4° to 5°C (39° to 41°F) immediately upon delivery in a refrigerated truck. The eggs are rotated so those that arrive at the store first are the first ones sold. Stores have a cold storage area where eggs might be briefly held before being displayed in a refrigerated area of the store - usually the dairy case.



Making a decision at the egg case

Read the Label

It is becoming increasingly important to Canadians to be aware of the nutrient content of foods. In January 2003, Health Canada regulations came into effect requiring most food packaging - including egg cartons - to carry a mandatory Nutrition Facts table that lists calories and 13 core nutrients.

Here is a sample of the Nutrition Facts table you would find on a carton of regular large eggs.

Nutrition Facts		
Per 1 large egg (50 g)		
Amount	% Daily Value	
Calories 70		
Fat 5 g		8 %
Saturated 1.5 g		8 %
+ Trans 0 g		
Cholesterol 190 mg		
Sodium 55 mg		2 %
Carbohydrate 0 g		0 %
Fibre 0 g		0 %
Sugars 0 g		
Protein 6 g		
Vitamin A 8 %	Vitamin C	0 %
Calcium 0 %	Iron	2 %
Vitamin D 2 %	Vitamin E	6 %
Riboflavin 15 %	Niacin	6 %
Vitamin B₁₂ 30 %	Folate	15 %

Health Check™

Health Check™ is a program developed by the Heart and Stroke Foundation of Canada to help consumers make wise food choices. Every food product involved in the program will have an on-pack symbol, a Nutrition Facts table and an explanatory message. All eggs in Canada qualify for this symbol which tells consumers that eggs are a healthy choice. This symbol will be appearing on more and more egg cartons in the future.

For more information about Health Check™, visit www.healthcheck.org.



† Enjoying a variety of foods is a part of healthy eating. Eggs are a nutritious food and, like many foods, should be eaten in moderation. Canadian egg producers financially support the Health Check™ education program. This is not an endorsement.



Eggs are a part of healthy eating

Specialty Eggs . . . So Many Choices

To offer consumers greater choice, research has led to the development of specialty eggs. These eggs might be slightly different in nutrient value than regular eggs or they may come from hens housed or fed in a special way. Here are some of the specialty eggs you might find at your supermarket:

- **Omega-3 Enhanced eggs** – contain a higher level of omega-3 polyunsaturated fatty acids which have been associated with a reduced risk of heart disease.
- **Vitamin-Enhanced eggs** – contain higher levels of certain nutrients including vitamin E, folate, vitamin B₆ and vitamin B₁₂.
- **Organic eggs** – produced by hens fed certified organic grains.
- **Vegetarian eggs** – produced by hens fed a diet containing only ingredients of plant origin.
- **Premium Quality eggs** – have stronger shells and thicker whites than regular eggs, and exceed the requirements for grade A eggs.
- **Free Run eggs** – produced by hens that are able to move about the floor of the barn.
- **Free Range eggs** – produced by hens that are able to move about the floor of the barn and have access to outdoor runs.

Buying & Handling Eggs

What are Processed Eggs?

Processed eggs are shell eggs broken by special machines at a breaking station then pasteurized before being further processed and packaged in liquid, frozen or dried form. Pasteurization is a process where the liquid egg is heated to a very high temperature to kill any possible bacteria. About 30% of the eggs produced in Canada are sold for processing. Processed egg products may contain preservatives and flavour or colour additives, and are used in the manufacturing of many foods such as mayonnaise, noodles and baked goods. They are also used to make non-food items including pharmaceuticals, shampoo, pet foods and adhesives.



Smart Shopping

To ensure top quality, buy Canada Grade A eggs that have been kept refrigerated and that have clean, uncracked shells. Look for the maple leaf symbol on the carton indicating Canada A; this is the sign of grade A eggs. When buying eggs, check the Best Before date on the carton. The date indicates the length of time the eggs will maintain their grade A quality.



When grocery shopping, pick up eggs near the end of your shopping trip. Ask the cashier to pack them with frozen items to keep them cold on the way home. Keep them in the coolest part of your vehicle on the way home. Get them home and into the fridge as soon as possible.



At Home - Handling Eggs

The last stop in the egg's journey is your home. Eggs should be stored in their carton in the main body of the refrigerator. The carton protects the eggs and prevents them from absorbing strong odours and flavours of other foods through the thousands of tiny pores in the shell. It also means the Best Before date is available for reference. Keeping eggs in the main body of the refrigerator rather than on the door ensures they are stored at a more consistent and cooler temperature which will limit the growth of bacteria.



Egg farmers, graders and retailers all do their part to keep eggs safe. It is important that you do your part in the kitchen as well. When preparing eggs or any perishable foods, follow these four simple steps to make sure food is prepared safely:



For more information on safe food preparation and fighting bacteria, consult the *FightBAC!*TM website at www.canfightbac.org or call the Food Safety Info Line at 1-800-892-8333.

Now You're Cooking - With Eggs!

Wholesome, versatile and delicious, eggs can inspire quick-to-prepare meals. And they're not just for breakfast anymore. Eggs make a quick, convenient and tasty lunch, dinner or snack, whether fried, poached, scrambled, hard-cooked or included as a key ingredient.

Here are some handy tips to follow when preparing eggs:

- *Cool hard-cooked eggs quickly once the cooking time is up by placing them in cold water. Rapid cooling helps prevent a green ring from forming around the yolk.*
- *For fluffy, thick scrambled eggs, cook over medium-low heat.*
- *When preparing omelettes, add water instead of milk. The water will turn to steam producing a light, airy omelette.*
- *When making meringue, use a glass or metal bowl instead of a plastic bowl. There may be an indiscernible greasy film on a plastic bowl which can prevent foaming.*

For recipe ideas, visit the websites listed on the back cover of this booklet.



The News About Nutrition

Eggs are one of nature's most nutritious foods. They are an excellent source of high-quality protein, which is essential for growth and development. Eggs contain all nine essential amino acids, making them a complete protein. In fact, the pattern of amino acids found in eggs is so perfect for our bodies that scientists use eggs as a standard to measure the protein quality of other foods. Eggs provide many vitamins and minerals including vitamin B₁₂, riboflavin, vitamin D, folate and iron - yet one egg has only 70 calories and just 5 grams of fat.

Cholesterol

Eggs also contain cholesterol, a natural substance which your body needs. In fact, your body makes cholesterol and uses it to digest food and produce vitamin D. A study by the Harvard School of Public Health found that there is no significant link between eating eggs and developing cardiovascular disease in healthy individuals.¹ When it comes to cardiovascular disease, it's the saturated and *trans* fats found in pastries, snacks, processed foods and any foods containing hydrogenated oils that raise blood cholesterol levels. It is also important to be active and to eat a wide variety of nutritious foods.

¹ Hu et al, 1999. A prospective study of egg consumption and risk of cardiovascular disease in men and women. JAMA 281(15) 1387-1394.

Canada's Food Guide to Healthy Eating

One to two eggs provide a serving from the Meat and Alternatives group in *Canada's Food Guide to Healthy Eating*. A wide variety of foods from the four food groups and an active lifestyle are recommended in order to maintain a healthy body.

Canada's Food Guide to Healthy Eating recommends the following number of servings each day:

Grain Products	5 – 12
Vegetables and Fruit	5 – 10
Milk Products	
Children 4 – 9 years	2 – 3
Youth 10 – 16 years	3 – 4
Adults	2 – 4
Meat and Alternatives	2 – 3



Eggs make a great dinner



Niçoise Salad

We hope you enjoyed following the egg's journey. As you have learned, great care is taken to ensure that Canadians are provided with a steady supply of the best quality eggs, in the safest manner. Canadian egg farmers are proud to provide Canadians with the wholesome, nutritious and delicious Extraordinary Egg.

For additional copies of this booklet or other information, contact:

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Abbotsford, B.C.
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www.bcegg.com

Alberta Egg Producers
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Calgary, Alberta
T2E 7C8
www.eggs.ab.ca

Saskatchewan Egg Producers
P.O. Box 1263, Station Main
Regina, Saskatchewan
S4P 3C4
www.saskegg.ca

Manitoba Egg Producers
18-5 Scurfield Boulevard
Winnipeg, Manitoba
R3Y 1G3
www.mbeegg.mb.ca

Ontario Egg Producers
7195 Millcreek Drive
Mississauga, Ontario
L5N 4H1
www.eggsite.com

Fédération des producteurs d'œufs
de consommation du Québec
555 Roland-Therrien Boulevard
Longueuil, Québec
J4H 3Y9
www.oeuf.ca

New Brunswick Egg Producers
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Nova Scotia Egg Producers
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Breakfast in a Jiffy



Egg Salad Pitas



Country Frittata



Omelette Tacos



Egg Salad Pitas



5	hard-cooked eggs, peeled	5
½ cup	cottage cheese, 1% M.F.	125 mL
¼ cup	each chopped red pepper and celery	50 mL
2 tbsp	finely chopped green onion	30 mL
1 tbsp	each light mayonnaise and sweet relish	15 mL
	Salt and pepper, to taste	
2	whole wheat pita breads	2
	Curly lettuce	

In a large bowl, using a pastry blender or a fork, coarsely chop or mash eggs. Stir in cottage cheese, red pepper, celery, green onions, mayonnaise and relish; mix well. Season with salt and pepper. Cut each pita bread in half and line each pocket with a lettuce leaf. Fill with egg salad mixture, about ½ cup (125 mL) in each pocket.

Number of servings: 4
Preparation: 10 minutes

Nutrients per serving
Calories: 217
Protein: 14.9 g
Carbohydrate: 20.1 g
Fat: 8.3 g

Omelette Tacos



2	eggs	2
1 tbsp	water	15 mL
	Salt and pepper, to taste	
	Cooking spray	
2	taco shells, warmed	2
	Shredded lettuce, salsa, low-fat sour cream, shredded low-fat cheese, hot pepper slices	

Beat eggs with water; season with salt and pepper. Spray an 8-inch (20 cm) non-stick skillet with cooking spray. Heat skillet over medium-high heat. Pour in egg mixture. As mixture sets at the edges, with spatula, gently lift cooked portion to allow uncooked egg to flow underneath. Cook until bottom and top are set. Slide onto a warm plate. Roll up omelette. Slice crosswise into ¼-inch (6 mm) slices. Fill taco shells with an equal amount of omelette strips. Garnish filled tacos with shredded lettuce, salsa, sour cream, shredded cheese and hot pepper slices, as desired. Serve immediately.

Number of servings: 1
Preparation: 7 minutes
Cooking: 5 minutes

Nutrients per serving
Calories: 377
Protein: 21.1 g
Carbohydrate: 24.3 g
Fat: 22.0 g

Breakfast in a Jiffy



2	eggs	2
2 tbsp	milk	30 mL
	Pinch of dried basil or Italian seasoning	
	Salt and pepper, to taste	
2 tbsp	shredded Cheddar cheese	30 mL
½ tsp	chopped parsley (optional)	2 mL

In a microwaveable mug, beat together eggs, milk and seasonings. Cover loosely with plastic wrap, turning it back slightly to vent. Microwave on MEDIUM-HIGH (70%) 1 to 1-½ minutes. Remove plastic and stir. Sprinkle with cheese and parsley; cover and let stand 1 minute.

Number of servings: 1
Preparation: 5 minutes
Cooking: 3 minutes

Nutrients per serving
Calories: 221
Protein: 17.0 g
Carbohydrate: 2.9 g
Fat: 15.2 g

Country Frittata



	Cooking spray	
1 cup	chopped cooked ham	250 mL
½ cup	chopped onion	125 mL
2 cups	frozen hash brown potatoes	500 mL
4	eggs	4
2 tbsp	water	30 mL
	Salt and pepper, to taste	
½ cup	shredded Cheddar cheese	125 mL
	Tomato chutney or chunky salsa, to taste	

Spray an 8-inch (20 cm) non-stick skillet with cooking spray. Heat skillet over medium-high heat. Add ham and onion, and sauté until onion is tender; set aside. Generously spray skillet again with cooking spray and cook potatoes over medium heat until tender and golden brown. Beat together eggs, water, salt and pepper in a bowl; pour over potatoes. As eggs begin to set, lift edges to allow the uncooked egg to flow underneath. When eggs are set, spoon ham and onion mixture on top. Sprinkle with cheese; cover skillet to melt cheese. Cut into wedges and serve with tomato chutney.

Number of servings: 2
Preparation: 5 minutes
Cooking: 12 minutes

Nutrients per serving
Calories: 577
Protein: 39.5 g
Carbohydrate: 41.8 g
Fat: 27.7 g