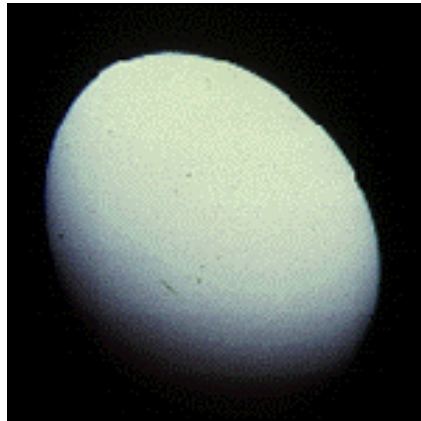


CARIBBEAN POULTRY ASSOCIATION

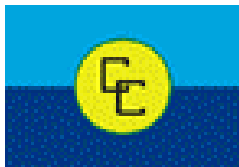
The

E

Extraordinary



gg



Thank you from the Caribbean Egg Producers

The **Caribbean Poultry Association (CPA)** would like to thank the following organisations for the support they have provided Caribbean egg producers to improve the quality, safety and competitiveness of our industry.

The **Canadian Egg Marketing Agency (CEMA)** is a producer organization that manages the production, promotion and pricing of eggs in Canada. The **Canadian Food Safety Inspection Agency (CFIA)** is responsible for regulating food safety in the Canadian egg industry. CEMA and the CFIA have provided technical assistance to develop CPA egg promotion programs, grading standards and on farm food safety programs and CEMA has kindly allow us to adapt this booklet from their own “The Extraordinary Egg” booklet.

The Canadian **Caribbean Program for Economic Competitiveness (CPEC)** and the **Livestock and Livestock Products Board (LLPB)** of Trinidad and Tobago have provided resources to develop and train producers and government officers in our egg industry programs

1. CPA Egg Promotion Program
2. CARICOM Egg Grading Standards
3. CARICOM On Farm Food Safety Program for Egg Producers

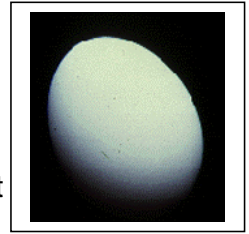
The **Caribbean Regional Organisation for Standards and Quality (CROSQ)**, the **CARICOM Chief Veterinary Officers/ Chief Environmental Officers** and the **CARICOM Secretariat** for their supportive role in the development and adoption of these programs as harmonised regional standards and codes of practice.

Bernhard Bergen
President, Caribbean Poultry Association
October 2004

IF YOU HAVE ANY QUESTIONS, OR WOULD LIKE MORE INFORMATION, PLEASE CONTACT ANY OF THE OFFICES LISTED ON THE BACK OF THIS BROCHURE.

Eggs – An Important Part of a Healthy Well Balanced Diet

CARICOM's egg producers are proud to provide fresh, high quality eggs to Caribbean consumers everyday.



Fresh From Farm to Table in a Week

Egg producers and our Ministries of Agriculture and Health work closely at every stage so that Caribbean consumers can have confidence in the quality of the eggs they eat.

Contributing to Our Health

Eggs provide us with complete protein, and are a natural source of essential vitamins and minerals needed for good health.

Working for Us in Many Ways

At home, in commercial food production and in the manufacturing of non-food items, eggs are a vital ingredient.

A Part of Our Economy

There are about 600 commercial egg farmers and 2,000 smaller backyard egg farmers bring about 400 million dozen eggs to the Caribbean marketplace each year. The egg industry contributes approximately \$50 million annually to the Caricom economy.

THE EXTRAORDINARY EGG - From farm to table, here is our story of *the Extraordinary Egg.*

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At The Farm

Which came first, the chicken or the egg? This age old question has been debated by many scholars. While we may never all agree on which came first, we do know that how we get eggs to market has changed dramatically through the years.

The Road to Automation

An increase in demand for poultry and eggs during World War II triggered the development of modern production practises. To meet the nutritional needs of more people on the same amount of land, with fewer workers, new breeding, feeding and management methods were required. Soon we saw hens move from straw floors and farm yards to cages in highly automated barns.

Hens are now housed in clean, ventilated buildings where temperature, humidity and lighting are controlled for year-round comfort. Fresh food and water are constantly available.



**MUSIC IS
SOMETIMES
PIPED IN
TO HELP
SOOTHE THE
FLOCK**



Control systems regulate heat, light and humidity for day and nighttime patterns. Eggs automatically roll from cages onto conveyer belts for prompt collection.

Even manure management is much easier. Cage designs allow waste to drop right out of the cages into a manure disposal pit, keeping both the egg and hen clean and safe from disease.

A Working Life

The average laying hen produces more than 280 eggs a year. Hens begin egg production at five to six months (19 weeks) of age and continue to lay for at least 12 months. The most common size of farm has between 10,000 - 20,000 hens, although farms range in size from several hundred to 300,000 hens. By having different flocks of hens at different ages, egg producers have a steady supply of eggs to market and a stable year-round income.

The most popular breed for egg production in Canada today is the White Leghorn - a small, light bird that lays far more eggs than its ancestors. Each stage of the

hen's development cycle requires specialized care and attention. Chicks are hatched at hatcheries, raised in pullet operations (pullets are hens less than 19 weeks of age), and then transferred to producers for their egg production life. Some producers run their own pullet operations.

Wild birds lay only in springtime when daylight hours are increasing. To stimulate laying hens to lay eggs all year round lighting is maintained for 14 to 17 hours a day.

In addition to light, a well balanced diet, fresh water and comfortable surroundings are essential for hen health and production. A hen's diet consists of grains, proteins, vitamins, minerals and plenty of fresh water. Every aspect from feed to egg collection is controlled and monitored so the hen has a comfortable, safe environment.

Why are some eggs brown and some white?

IT IS A MATTER OF GENES. SOME BREEDS OF HEN SUCH AS THE RHODE ISLAND RED LAY BROWN EGGS, WHILE OTHERS, LIKE THE WHITE LEGHORN LAY WHITE EGGS. BROWN OR WHITE, THERE IS NO DIFFERENCE IN NUTRITIONAL VALUE OR COOKING PERFORMANCE.



Collection Time

Eggs are gently hurried along on a moving belt to a central packing area on the farm. Here the eggs are placed in plastic, sanitized flats, 30 at a time, wide end up, to keep the yolk centred.



Flats are then placed on pallets and stored immediately in a cooler or cool room and chilled to 11° to 12° C. At this temperature, eggs retain their freshness and quality while awaiting shipment to a registered grading station - usually within four days.

FREE RUN EGGS

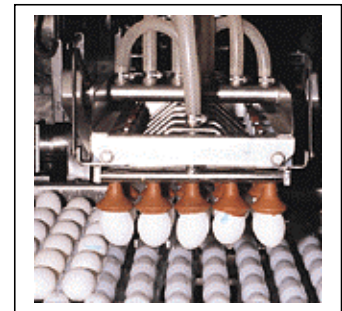
ARE LAID BY HENS THAT ROAM THE HEN HOUSE FREELY. THEY ARE OFTEN SOLD BY SMALL PRODUCERS DIRECTLY FROM THEIR FARMS. EGG QUALITY IS MORE DIFFICULT TO MAINTAIN SINCE EGGS CAN COME IN CONTACT WITH DROPPINGS AND DIRT, AND ARE MORE EASILY DAMAGED BY HENS. SINCE THESE EGGS ARE OFTEN NOT GRADED, EXTRA PRECAUTIONS SHOULD BE TAKEN WHEN SELECTING AND PREPARING THEM.

Making The Grade

Once the eggs reach the grading station the second part of their journey begins. High-speed, electronically controlled equipment provides a continuous automated process to carry out these tasks.

The first stop is a temperature controlled storage room. Here the optimum temperature and humidity maintains the freshness and quality of the eggs until it's their turn for grading. Most eggs are graded within 24 hours of arriving at the station.

The grading process begins with flats of eggs being lifted onto an assembly line. Metal arms with suction cups gently lift the eggs from the flats onto a moving track. The eggs are then washed and sanitized in a high speed tunnel washer that gently scrubs the eggs. After washing, a thin film of odourless mineral oil may be applied to help seal the porous shell. From here the eggs are examined using a process called candling



During candling, the egg passes over a strong light. The light 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, as it holds the yolk in position). Any eggs that do not meet grade A standards are marked by the grader and removed from the production line by an electronic sensor.

To qualify as Canada Grade A, the egg must have a thick white, a well centred yolk, a very small air cell and a clean sound shell. Only grade A eggs are sized.

WHAT DOES A GRADING STATION DO?

CLEAN, CANDLE, GRADE, SORT, CARTON AND SHIP TO STORES OR COMMERCIAL FACILITIES.

Each egg is weighed electronically, separated by size and directed to a cartoning station. All cartons are recyclable and may be made of plastic, foam or fibre. Every carton is stamped to indicate the Best Before date. The Best Before date lets you know how long the eggs will maintain their grade A quality. It is usually 35 days after grading. If the eggs have been kept refrigerated they are still safe to use after this date but they lose quality. For best results use eggs before the Best Before date.



Quality Guarantee

After cartoning, fresh eggs are again stored under refrigeration until they are sent to stores and restaurants. Before they are shipped, federal inspectors take random samples of the cartoned eggs for individual testing. Samples are candled, then temperature and size are measured, all to make sure they meet grade A specifications. Inspectors also break eggs and measure the relationship of egg weight and white (albumen) height. It is measured in Haugh Units (H.U.). The higher the Haugh Unit, the better the white (albumen) quality of the egg.

EGGS ARE SIZED BY WEIGHT. THERE IS A WEIGHT RANGE FOR EACH SIZE. THE MOST POPULAR SIZES ARE:

peewee -- under 42 g small -- 42 g - 48 g medium -- 49 g - 55 g
large -- 56 g - 63 g extra large -- 64 g - 69 g jumbo -- over 69 g

Quality control inspectors also monitor ungraded eggs, at the grading station, to assess the production quality of specific flocks.

Once approved, the graded eggs are shipped to supermarkets in cartons and to restaurants and institutions in 2 1/2 dozen flats.

Eggs you buy at the store often arrive there within four days of being laid. Freshness is synonymous with Canada Grade A.

What Happens To All Those Eggs?

Every year the hens produce nearly half billion dozen eggs. Of these, 82% are sold in their shell.

The remaining 18% (of all grades and sizes) are processed into liquid, frozen or dried form. These processed eggs are used in the manufacturing of many foods, including mayonnaise, noodles and baked goods. Processed eggs are also used to make other items such as pharmaceuticals, shampoo, pet foods and adhesives.



The eggs set aside for these uses are sent to egg processing plants. Special machines break eggs by the thousands and can separate yolks from whites. Whole or separated, the eggs are then pasteurised and sent in bulk form to bakeries and other customers of processed products.

There are three possible grades for eggs. Agriculture and Agri-food Canada sets the regulations and standards for grading. Only the best make Canada Grade A.

Care and Safety, Number One

Like meat, milk, fish, and other perishable foods, eggs can be served without safety concerns when properly handled and refrigerated.

Bacteria are found everywhere in our environment -- in soil, water, animals, and insects -- so we cannot realistically eliminate all bacteria, but we can take actions to control the growth of harmful bacteria.

Bacteria need food, moisture and, above all, ideal temperature conditions to multiply. Below 4° C and above 60° C there is little or no growth. The secret to preventing bacteria from multiplying is to control these factors.

From the farm gate to the table, everyone has a role to play in keeping our food supply safe

At the Farm

"Start Clean -- Stay Clean" is a producers' program aimed at eliminating opportunities for bacteria growth on the farm. It includes:

- buying pullets, feed and supplements from suppliers with disease prevention programs in place;
- setting up restricted zones -- generally the laying house, the egg collection room and the cooler where personnel movement is kept to a minimum and special clothing and cleaning procedures are established;
- pressure washing and sanitizing walls, ceilings, rafters, fans, heaters, cages, drinkers, and feeders;
- removing manure regularly;
- monitoring and maintaining proper ventilation, air temperature and moisture levels;
- frequent egg collection and quick removal of dirty, cracked or broken eggs;
- storing of collected eggs in a cooler or cool room at 11° to 12° C; monitoring flock health by recording feed and water intake, rate of lay, egg quality, bird behaviour and appearance.



At the Grader

Graders take great care to maintain optimum temperature and humidity levels for the eggs that reach their doors. They are also responsible for washing and inspecting the eggs for interior and exterior quality.

Cracked eggs are automatically removed from the line. Agriculture and Agri-food Canada inspects all registered egg stations, focusing on plant sanitation and operating conditions.



During Transportation

Maintaining the appropriate temperature level is the primary concern of the transporter. Too warm a temperature provides an opportunity for bacteria to grow and overall egg quality to be reduced.



In Our Homes

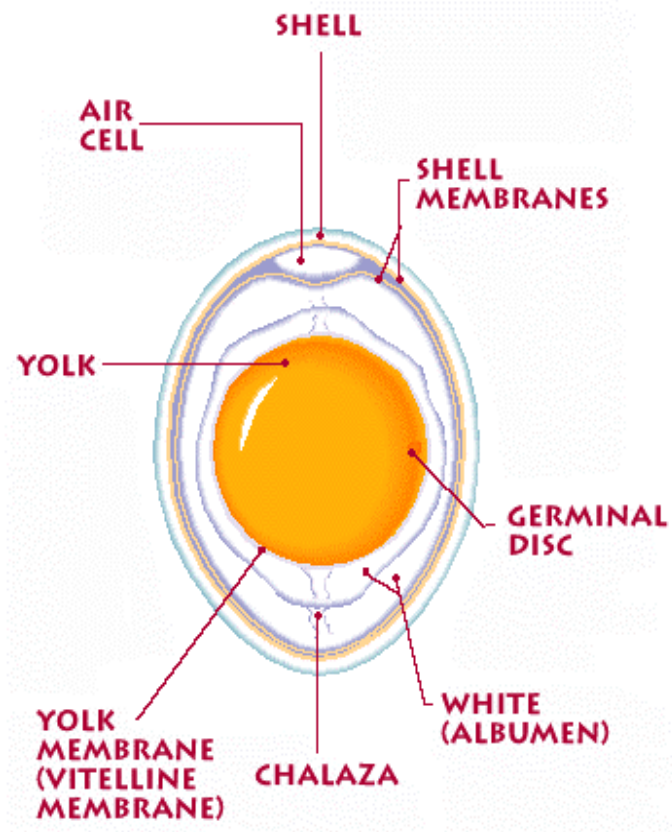
Once you bring eggs home, refrigerate them in their cartons until ready for use. This way you protect them from possible cross-contamination from other foods and maintain their fresh quality longer. Be sure to check the carton for eggs that might have cracked in transportation and discard them. When you are preparing eggs (or any perishable food) keep these tips in mind:

- always wash your hands first;
- wash utensils used for raw eggs before reusing for other raw foods or cooked products that includes knives and cutting boards;
- serve hot foods hot and cold foods cold;
- do not allow foods to sit at room temperature for a long period of time;
- leftovers should be refrigerated in covered containers immediately after serving;
- do not mix leftovers from the serving table with other food that is still on the stove or in the refrigerator, since the difference in temperatures can stimulate bacteria growth;
- use leftovers within four days.

At The Store

It is recommended that retailers refrigerate eggs at 4° to 5° C immediately upon delivery and rotate stock so "First In" is "First Out".

Egg-Anatomy



The Extraordinary Egg

Egg-anatomy

SHELL

- the first line of defence against the entry of bacteria
- can be brown or white; nutritional value of the egg is the same
- composed mainly of calcium carbonate
- approximately 8,000 to 10,000 tiny pores allow moisture and gases in (O₂) and out (CO₂)

SHELL MEMBRANES

- there are two membranes on the inside of the shell
- one membrane sticks to the shell and one surrounds the white (albumen)
- the second line of defence against bacteria
- composed of thin layers of protein fibres

GERMINAL DISC

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

WHITE (ALBUMEN)

- there are two layers: thin and thick albumen
- mostly made of water, high quality protein and some minerals
- represents 2/3 of the egg's weight (without shell)
- when a fresh egg is broken, the thick albumen stands up firmly around the yolk

CHALAZA

- a pair of spiral bands that anchor the yolk in the centre of the thick albumen
- the fresher the egg the more prominent the chalazas
- unnoticeable when the egg is cooked

YOLK MEMBRANE (VITELLINE MEMBRANE)

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

YOLK

- the egg's major source of vitamins and minerals, including protein and essential fatty acids
- represents 1/3 of the egg's weight (without shell)
- yolk colour ranges from light yellow to deep orange, depending on the hen's food

AIR CELL

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

Egg-cellent Nutrition

Eggs are a natural source of goodness because they contain so many nutrients. Authorities are now recommending that eggs can be an important part of a good diet combined with a health lifestyle

Canada's Food Guide to Healthy Eating suggests that one to two eggs as a serving from the Meat and Alternatives group.

The American Heart Association has revised its recommendation to allow for the consumption of one egg a day.

Eggs are an excellent source of high quality protein. Protein 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 to use, that scientists use eggs as a standard to measure the protein quality of other foods. In addition to protein, eggs also contain a significant number of vitamins and minerals, yet one egg has only 71 calories. Eggs also contain a small amount of fat, about 5 grams per egg. More than half (52%) of this fat is unsaturated and one third (31%) is saturated. Fat is a compact source of energy, it also helps the body absorb fat soluble vitamins (A,D,E,K) and makes hormones and bile acids.

Cholesterol is another type of fat found in egg yolks. In the past some people were concerned about eating foods that contained cholesterol. Current research suggests that dietary cholesterol has a minimal impact on most peoples health, and that the most effective means of decreasing blood cholesterol levels is to reduce your intake of saturated fat. As a result, foods such as eggs, milk products, meat and shellfish, that contain cholesterol can be a regular part of a healthy diet.

One large egg contains

	300 kJ / 71
	6.0g
Energy / cal	5.0 g
Protein	0.8 g
Fat	2.0 g
Polyunsaturates	1.5 g
Monosaturates	190 mg
Saturates	0.5 g
Cholesterol	
Carbohydrates	

	9 %
Percentage of recommended daily intake*	8 %
	10 %
	3 %
	14 %
Vitamin A	7 %
Vitamin D	2 %
Vitamin E	15 %
Thiamin	29 %
Riboflavin	15 %
Niacin	2 %
Vitamin B6	6 %
Folacin	2 %
Vitamin B12	4 %
Pantothenic Acid	5 %
Calcium	17 %
Phosphorus	
Magnesium	
Iron	Nutrient
Zinc	Analysis,
Iodine	1999

* Based on Recommended Daily Intakes for Canadians established by Health Canada.

Egg-citing Cuisine

Wholesome, versatile and delicious, eggs provide you with fast meal solutions. Quick entrees, nutritious snacks and superb salads can all be yours with a minimum of effort.

Start your day sunny side up. Breakfast is still the most important meal of the day. Even if you've only got a minute, you've got time to shake an egg for a morning drink, scramble them in a mug, or roll up an egg tortilla for the road.

Add a little sunshine to those lunch time blues with an egg salad taco, egg salad pita-wich or an egg pasta salad.

Prepare main dishes with ease and flair with egg-inspired pastas, fajitas, quiches, pizzas, soups and souffles.

Whether you are using them on their own or as a helper, all you need to do is follow a few basic rules and you'll have perfect results every time:

- Use a moderate temperature and don't overcook eggs. Cooking at too high a temperature or for too long at low temperatures causes toughening.
- To prevent curdling when adding eggs to a hot mixture, add a small amount of the hot mixture to eggs first, then add the eggs to the dish.
- Always break your eggs into a clean container before cooking or mixing with other ingredients. This way any small shell fragments can be removed with a clean utensil.
- Use eggs straight from the refrigerator. They are perishable and lose one day's freshness for each hour they are kept at room temperature.
- For the highest volume when beating egg whites, let the eggs sit at room temperature for just 15 minutes prior to beating.

Have fun. Experiment a little. And, most importantly, Get Cracking! Enjoy the Grade A Goodness of eggs.

Eggs are the essential helper in the preparation of many foods. They thicken custards and sauces, leaven souffles and cakes, bind meats and stabilize emulsions, such as mayonnaise.

Egg-citing Caribbean Cuisine

Breakfast in Mug	
Egg Burger	
Egg & Cheese Dog	
Egg Ball	

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