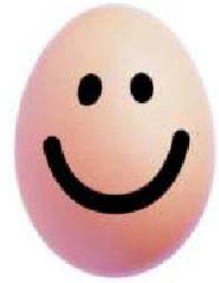


FACT SHEET 7

WHAT IS AN EGG MADE OF?



The first part of the egg to develop is the yolk. The albumen layers (egg white) are then formed, the shell membranes surround these layers and the final stage is the formation of the shell. The complete process takes twenty four to twenty six hours. The hen starts the process of producing another egg within 30 minutes of laying.

YOLK

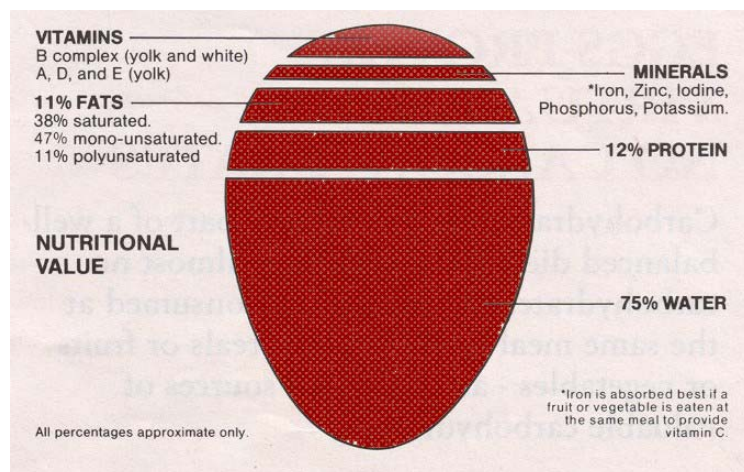
The yolk makes up 31% of the total weight of the egg. In an average size 55 gram egg 17 grams is yolk. The yolk is made up of 51% water, 16% protein, 30.5% fat, and some minerals. The yolk is contained within a fine elastic membrane called the vitelline membrane.

Yolk colour does not influence the eating qualities of the egg but is perceived by the consumer to reflect the quality of the egg. The colour of the yolk is determined by naturally occurring yellow pigments called carotenoids which the hens obtain from their feed. These pigments are found in natural products such as carrots, tomatoes, maize and other plant material. Grass, maize, carrot and pumpkin all produce a darker yolk. There is very little in grains such as wheat, barley and sorghum. The required colour is achieved by the addition of either sufficient natural materials containing the pigment into the diet or by using a purified form usually extracted from natural products.

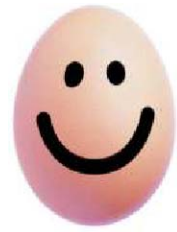
The colour of the yolk reflects only what the hen has been eating and has no relationship to the nutritional value of the egg.

A circular white spot called the germinal disc can be seen on the surface of the yolk. In fertile eggs the germinal disc is where the embryo chick begins its development. However, eggs produced by commercial egg farmers for human consumption are not fertile. In a fertile egg the yolk provides food for the developing chick.

Red flecks in eggs are blood spots, usually caused by the rupture of blood vessels during ovulation. Blood spots don't indicate a fertile egg and they're nothing to worry about. They can be removed or eaten.



FACT SHEET 7 (cont.)



WHAT IS AN EGG MADE OF?

ALBUMEN (EGG WHITE)

Around the yolk is the egg white - a clear jelly-like substance which makes up 58% of the weight of the egg. This means that an average 55 grams egg contains 32 grams of egg white. The white consists of 88% water, 9% protein and some minerals.

There are two layers in the egg white:

- A thick gelatinous layer of white immediately surrounding the yolk acts as a cushion for the yolk. In this thick layer of egg white are the chalazae which appear as rope-like cords attached to each end of the yolk. The chalazae act as anchors keeping the yolk in the centre of the egg.
- An outer layer of thinner white surrounds the thicker white and has a more liquid consistency.

SHELL MEMBRANES

The shell membranes consist of two layers which completely enclose the yolk and white of the egg in a dense fibrous sac. The membranes restrict any bacteria penetrating the egg. The outer membrane is firmly attached to the shell.

THE SHELL

The shell of the egg is rigid but brittle and provides protection for the contents of the egg. The shell makes up 11% of the weight of the entire egg.

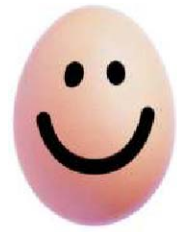
Approximately 98% of the shell consists of calcium with magnesium and phosphorus making up the other 2%.

The pigment deposits in the shell make up the colour of the egg. The shell colour does not change the quality or nutritional value of the egg. There is no difference in taste between a brown or a white egg.

The surface of the eggshell is covered with small holes or pores - as many as 17,000. These pores allow gases and water vapour to pass through the shell. A freshly-laid egg is covered with a thin transparent cuticle called the bloom. The bloom covers the pores which protects the egg from any bacteria.

During storage the bloom tends to break down making the egg contents more susceptible to strong odours, flavours or bacteria passing through the shell into the egg.

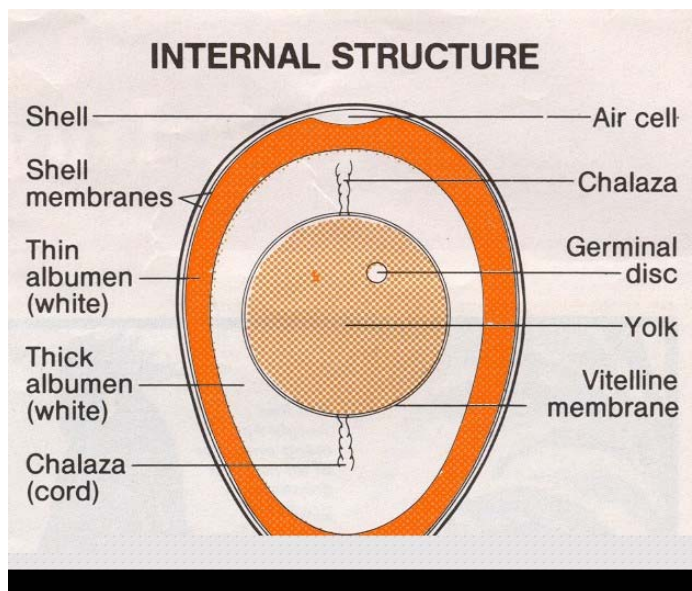
FACT SHEET 7 (cont.)



WHAT IS AN EGG MADE OF?

THE AIR CELL

Soon after an egg is laid, it cools and the inner membranes pull away from the outer membranes at the blunt end causing an air cell to form. As the egg ages, the egg loses moisture through the pores in the shell and the air cell becomes larger. Its size can therefore be used to determine the age of an egg.



As you can see from our diagram, the eggshell provides a neat little package for the contents inside. If you hold the egg up to a light you can see many tiny holes called pores, which allow air and water to pass through the shell. This is why it is important not to place eggs near foods with strong smells or flavours (like onions) because the eggs can easily take on that taste. The shell membrane surrounding the egg restricts bacteria penetrating the shell.

Reference

Stradelman. WJ and Cotterill. OJ. 1997. Egg Science and Technology. 2nd Edition, AVI Publishing Co.Inc.,Westport.