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NF97-354 Omega Eggs — A Dietary Source of n-3 Fatty Acids

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Omega Eggs — A Dietary Source of n-3 Fatty Acids

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Omega eggs are a type of "designer egg," in which the yolk's fatty acid profile has been modified by altering the hens' diet. This egg is an excellent model for the saying, "you are what you eat." Specific lipids — fatty acids and fat soluble vitamins — can be modified in the egg yolk by feeding the hen increased proportions of "good" fatty acids and increased amounts of fat soluble vitamins from dietary sources such as flax seed, fish oil or bioengineered algae. Omega eggs contain increased amounts (350 mg/egg) of n-3 fatty acids and decreased amounts of saturated fatty acids. The increase in yolk polyunsaturated fatty acid (PUFA) is accompanied by a substantial decrease in saturated fatty acids, creating a healthier fat profile. The laying hen is a good biological model, and will also convert linolenic acid (C18:3) to DHA (C22:6) and deposit both important n-3 fatty acids into egg yolk.

Table I illustrates the nutrient composition of a regular United States Department of Agriculture (USDA) large egg compared to the OmegaTM egg as licensed at the University of Nebraska. In the Omega egg, the ratio of n6:n3 fatty acids has been improved to 2.6:1. The Omega egg will provide 250-350 mg n-3 fatty acids, of which 100 mg are DHA (C22:6). In the human diet, one Omega egg serving would be equivalent to a one ounce serving of high oil fish (salmon) to provide essential n-3 fatty acids. Due to a special feeding and genetics program at the University of Nebraska Poultry Research facilities, the cholesterol content of Omega eggs has also been consistently reduced to 180 mg/egg, compared to the USDA standard egg value

Table I. Nutritive Value of Omega Eggs Compared to Standard Eggs

	Omega Egg 60 g - large egg	*Standard Egg 60 g - large egg*
Calories	75.0	75.0
Protein	6 grams	6 grams
Carbohydrate	.6 grams	.6 grams
Total Fat	6.0 grams	6.0 grams
Saturated Fat	1.5 grams	2.2 grams
Polyunsaturated Fat	1.35 grams	.90 grams
n-6 Fatty Acids	750 mg	800 mg

of 210 mg/egg. Current UNL research is testing the taste and health benefits of Omega versus standard eggs. Omega eggs fared well in their taste comparisons (1) to regular eggs and human hypercholesterolemic subjects could eat up to 12 eggs per week (2) with no increase in serum cholesterol and a 14 percent reduction in serum triglycerides when on a Step 1 heart healthy diet.

n-3 Fatty Acids	350 mg	60 mg
C18:3	250 mg	40 mg
C22:6	100 mg	20 mg
n-6:n-3 Ratio	2.6	13.0
Monounsaturated Fats	2.8 grams	2.4 grams
Cholesterol	180 mg	210 mg

Why are n-3 fatty acids important in the human diet?

In the past 20 years, much research has been conducted which provides a major link between intake of n-3 fatty acids and the risk of cardiovascular disease. The beneficial role of n-3 fatty acids, particularly DHA (C22:6), in thrombosis, arrhythmia and HDL:LDL ratios is becoming more clearly established in both medical and nutrition research. Both Canada and the United Kingdom have established dietary guidelines for the daily intake of these important fatty acids. European infant formula companies regularly supplement infant formulas with DHA to support early retinal and neural (brain) development. Research analysis of U.S. diets indicate a low n-3 fatty acid intake, particularly among pregnant women (3).

Many Midwesterners do not consume oily fish regularly enough to provide adequate n-3 fatty acid intake (4). The Omega egg, and other designer egg counterparts, have been developed to provide consumers a natural, healthy n-3 fatty acid dietary alternative. Omega eggs and other designer eggs are available in specific consumer markets throughout the United States, including several markets in Nebraska.

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