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What Is Cholesterol, Where Do We Get It And Why Do We Need It?

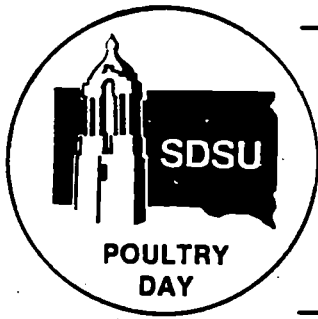
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WHAT IS CHOLESTEROL, WHERE DO WE GET IT
AND WHY DO WE NEED IT?

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POULTRY 84-4

Cholesterol is a high molecular weight alcohol found in all animal tissue. When purified it is a yellow compound and its molecular structure is similar to and really the parent compounds from which the bile acids, sex hormones, vitamin D and adrenal hormones are produced as diagrammed in Figure 1. In an adult human, cholesterol is synthesized in the liver at the rate of 1.5 - 2.0 gm per day. Therefore, the normal dietary intake of from 200 to 600 mg is only a small part of what there is to work with. Dietary sources are foods of animal origin - relative amounts are shown in Table 1.

Consumption of 2 eggs would provide about 520 mg of cholesterol with the values as shown in this table. The American Heart Association recommends that cholesterol intake be limited to 300 mg per day. This means that egg consumption therefore, would have to be limited to less than one a day if other animal foods are consumed. That one recommendation has to be a major reason for yearly per capita egg consumption declining from over 400 in 1946 to around 260 today. Our main concern with the AHA is that they believe the epidemiological reports which conclude that populations consuming more cholesterol have higher blood levels of cholesterol and subsequently higher incidences of coronary heart disease. It is true that cholesterol may form a deposit in the walls of arteries and may cause a blood clot to form or otherwise restrict blood flow to the heart as well as other parts of the body. However, there still is no clear evidence that dietary cholesterol has any effect upon the blood level of cholesterol in most persons that do not consume excessive calories. Further, people with high blood cholesterol levels may show very limited cholesterol deposits, others with low cholesterol levels may have excessive deposits. What causes deposition is unknown.

There have been several studies showing that up to 4 eggs per day have not caused any significant effect on blood cholesterol levels. This work was capped by the report from Texas A & M University (O'Brien and Reiser 1980) that showed the meat source to not affect the response either. Red meats; fish or poultry were involved.

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Professor and Leader, Poultry Research and Extension,

Getting back to the metabolism diagram in Figure 1, cholesterol is essential to life. Without bile acids as formed from cholesterol we could not digest and absorb fats. This requires the major quantity and this varies with the amount of fat consumed. Each of the other uses indicated are essential to life, from the formation of cell walls to reproduction, as governed by the sex hormones. The adrenal hormones corticosterone and desoxycorticosterone are required for water and fat metabolism as well as in responding to stress. Vitamin D which regulates calcium utilization may be supplied as such in irradiated or supplemented milk but most of us that are exposed to sunlight produce all we need from cholesterol. The body has a feedback system which regulates cholesterol synthesis according to need, such that if we were to consume 1000 mg per day the liver would produce less than if we consumed 300 mg. Blood levels would remain the same.

In summary, cholesterol is essential to life and for most normal persons the usual diet which minimizes calories but includes cholesterol sources is not a major factor in influencing blood levels and coronary heart disease. With this background we need to emphasize the exceedingly high nutritional value and economy of eggs and poultry meat as well as most other animal products for the human dietary.

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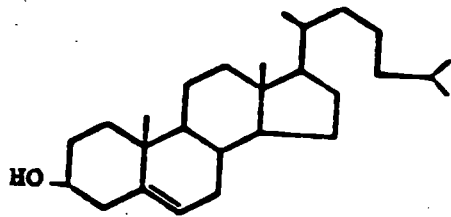
Table 1. Cholesterol Content of Foods

Food	mg/100 gm portion
Whole egg	480*
Chicken breast	85
Chicken drumstick	94
Turkey breast	76
Turkey leg	89
Duck	84
Goose	91
Beef chuck	106
Beef steak, sirloin	85
Beef heart	274
Beef liver	438
Lamb chop	122
Leg of lamb	89
Pork ham	55
Pork chop	98
Veal outlet	101
Salami	79
Vienna sausage	52
Braunschweiger	156
Milk 3.3 % fat	14
Milk 2.0 % fat	8
Cheese, cheddar	105
Ice cream, 10% fat	45

* 260 mg in a standard 2 oz egg.

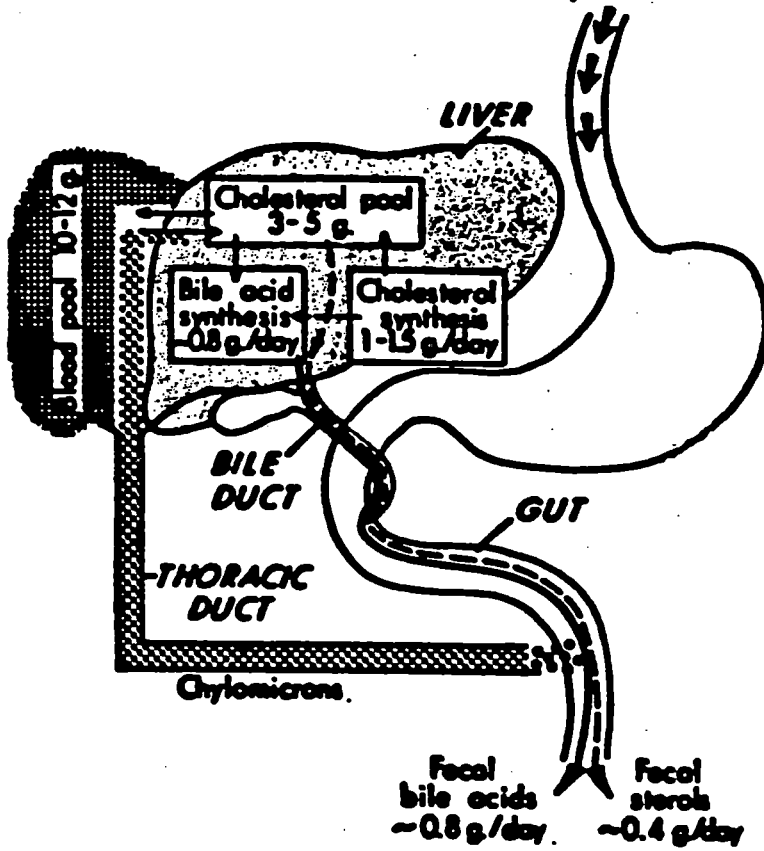
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Meat values were taken from "The Meat We Eat by Romans et al., 1985, the others from USDA Handbook 8.



Dietary cholesterol

200-600 mg/day



Other uses:
 Cell walls
 Sex Hormone
 Adrenal Hormone
 Vitamin D
 Others

Figure 1. Cholesterol and its Metabolism