Ice Cream, Cheese, Butter, and Whole Milk: Health Foods?

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Abstract

Not all fats are bad; in fact, we are now finding out that fatty acids which are unique to milk fat are indeed healthy and serve specific purposes in the body.

Introduction

A recent Time Magazine cover states “Eat Butter.” Time Magazine is basing this article on a March 2014 publication in the *Annals of Internal Medicine* that states that eating less saturated fat (ice cream, cheese, butter, and whole milk) doesn’t actually lower a person's risk for heart disease (Bauman). In addition there are certain fatty acids in milk fat that may be necessary in our diets.

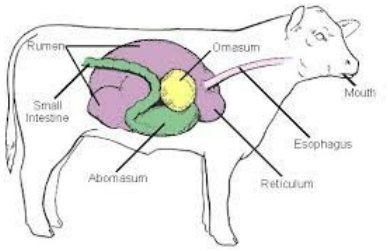
Fat may be defined as unsaturated or saturated. These definitions are based on the number of double bonds or the number of hydrogen ions in the carbon chain of the fatty acids. Unsaturated fats are further defined as being monounsaturated, meaning they have only one double bond in the carbon chain or polyunsaturated, meaning they have more than one double bond in the carbon chain (Bauman). Linolenic acid and linoleic are called essential polyunsaturated fats because our bodies need them but can’t make them so they have to be in our diet.

Saturated fats contain no double bonds in the carbon chain. Saturated fats are generally solid at room temperature and the primary source is from animal products (“Analysis).

Trans fats are made when unsaturated fats, such as vegetable oil, are artificially hydrogenated (hydrogen is added) to make them saturated so that they are solid at room temperature. Examples are Crisco and margarine. Trans fats have been shown to be unhealthy. Studies have shown an increase in the incidence of heart disease with increasing margarine intake but not with butter intake.

Scientists and doctors use to say that we should all reduce fat in general. In fact, it got to the point where people were substituting carbohydrates and sugar for fat. Pasta was the fad food as people tried to reduce fats in their diets. The result was that our bodies digested these sugars very rapidly and caused a spike in insulin which signaled the body to store the sugar as fat and lead to more obesity.

Now we know that fat in our diet can actually be healthy. Unsaturated fats reduce the incidence of heart disease. Saturated fats are actually neutral; they don’t increase or decrease the incidence of heart disease.



This is an image of a cow's digestive tract.

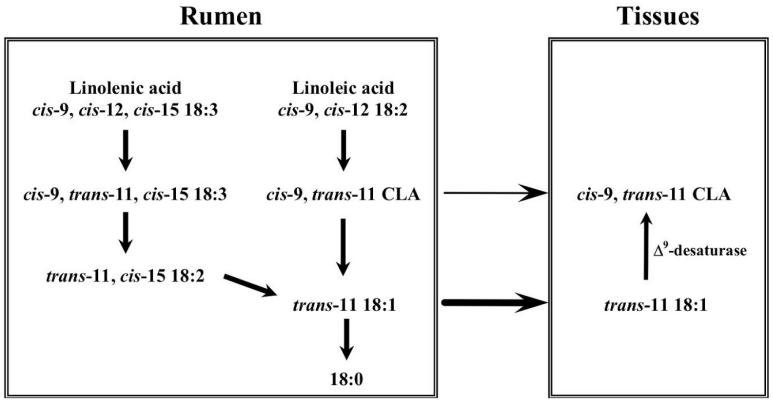
"Secrets of Milk - Get the Stories, Secrets and Facts About Milk."HealthyEating.org. N.p., n.d. Web. 05 Jan. 2016.

Let's discuss how milk fat is made in ruminants such as cows, sheep, and goats. Ruminants have a very unique digestive system. They have a stomach like we do but they also have a 3-compartment fermentation vat called the rumen that's unique to ruminants. The rumen contains bacteria and protozoa (let's call them rumen bugs). These rumen bugs pre-digest the nutrients that the cow consumes before they reach the true stomach. The way the rumen bugs digest fat is they biohydrogenate any fat source that they eat. This means they make saturated fats out of unsaturated fats. Cows eat grass and grain that contain unsaturated fatty acids. After the rumen bugs digest them they hydrogenate them and make saturated fats out of them.

Biohydrogenation simply means adding hydrogens to the carbons in fatty acids so that each carbon is saturated with as many hydrogens as possible. In the process of biohydrogenation, there are also fatty acids that are not completely saturated that are absorbed and end up in the milk fat. Conjugated Linoleic Acid (CLA) is one of these fatty acids. In people, the major source of CLA comes from dairy products. CLA has been shown to reduce the incidence of cancer in experiments with animals. CLA has also been shown to help reduce cardiovascular disease, diabetes, and help the immune system (Lock).

CLAs in milk fat are called "functional foods." A functional food is a food component that has a specific beneficial purpose other than just as a nutrient. They affect health and well-being or reduce the incidence of a disease.

Figure 1. Pathways for ruminal and endogenous synthesis of *cis*-9, *trans*-11 CLA in the dairy cow. Adapted from Bauman et al. (2003)



This is an image of the what happens in the Rumen.

Lock, Adam L., and Dale E. Bauman. "Dairy Products and Milk Fatty Acids As Functional Food Components."Proceedings of the 2003 Cornell Nutrition Conference, n.d. Web. 2 Jan. 2016.

Linoleic and linolenic acids are unsaturated fatty acids that occur naturally in the feeds that ruminants eat, such as grass (Lock). The 18:3, 18:2, 18:1, and 18:0 refer to the number of carbons in the fatty acid chain (18) and the number of double bonds (3,2,1, or none). *Cis* and *trans* refer to the three dimensional configuration of the molecule. You can see from this diagram that when a cow eats the unsaturated fatty acids, most of it ends up as saturated fat (18:0) which is also called stearic acid (Lock). Although, a small amount of it absorbed as the unsaturated fatty acid called CLA. Although there is a very small amount of CLA in milk fat, it is still a very potent compound (Bauman).

Now we know that saturated fats are not the bad guys in our diets. It was actually the refined sugars that we replaced for fats in our diet that were causing more obesity, diabetes, and heart disease (Lock). Everybody is eating low fat yogurt which is loaded with sugar. It's actually better to eat yogurt with more butterfat because it contains less sugar and it tastes better too. Whole milk contains less sugar than skim milk. High fat ice cream contains less sugar than low fat ice cream. And cheese is low in sugar.

In addition, there are specific fatty acids in milk fat that serve as functional foods.

Besides CLA, butyric acid, sphingolipids, and vaccenic acid in milk fat have been shown to reduce the incidence of disease (Lock). Since milk is the first food that a newborn baby calf, lamb, goat, or human consumes, these special fatty acids may serve a function that we are not aware of. As we learn more about these functional fatty acids, we may learn how to feed ruminants so that their milk can contains more of these fatty acids or maybe we will isolate these fatty acids so we can supplement our human diets with them.

"Secrets of Milk - Get the Stories, Secrets and Facts About Milk."HealthyEating.org. N.p., n.d. Web. 05 Jan. 2016.

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