## **Fuel For You**

DOYLESTOWN (Montgomery Co.) — How far would you get if you car's gas tank registered on empty? The car may sputter, then stop completely. By comparison, if you didn't replace your body's fuel a three or more times a day, your body would sputter, too.

Our bodies rely on three nutrients for fuel or energy --- carbohydrates, fats and proteins. Carbohydrate is the number one body fuel - it is efficient and gets to the cells in a speedy manner. Every cell in our body needs carbohydrate to perform its duties well, especially our brain cells.

Carbohydrates are classified as simple or complex. In their simple form, they are commonly called "sugars." Glucose is the sugar which circulates in the blood and brings energy into muscle, nerve and brain cells. Glucose combines with another simple sugar - fructose - and builds a double sugar, sucrose, more commonly known as table sugar. In fruits and vegetables the contents of glucose and fructose depend on the species, ripeness, and state of preservation.

Glucose combines with another sugar, galactose, and makes a double sugar, lactose, a commonly known milk sugar to which many have in intolerance. When glucose combines with another glucose, maltose is created.

When glucose combines with many other simple sugars in foods, a chain is created. This chain is known as a complex carbohydrate or starch. Through the process of digestion, the starch is broken down into its simplest components, such as glucose. Only in its most simplest form can the carbohydrate be taken in by the cell and used for fuel.

Our body stores carbohydrate in the liver as a starch. We must however replenish the liver stores approximately every four hours in order to keep the blood glucose level stable. When our blood glucose level starts to drop, the chain of stored starch is broken and some sugar is released into the bloodstream to keep it temporarily elevated. We then need to eat a meal to raise the blood sugar level to normal and keep it there until the next meal.

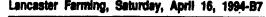
Fats, also called lipids, is a group which serves as a concentrated source of energy or fuel. Fats do not dissolve in water which makes it an excellent nutrient for storage of fuel in the body (which is mostly water). Also the fat or adipose cell is able to store fuel in 85% of it and leave the remainder for necessary functions. By contrast, the stored starch can occupy only about 15% of the cell with the remainder free for other functions. So the storage of fats in the cell provides an efficient way to carry a lot of backup fuel. It is important to remember that carbohydrates and proteins not immediately needed by the body are changed into fat, delivered and stored in the adipose cell to be used in the future. Although the body has limited ability to store starch, the body can store unlimited amounts of fat simply by creating more adipose cells. So in a sense, fat cells are the pantry of the body.

The word protein was derived more than a century ago from a Greek word meaning "of first importance." It was the first substance recognized as a vital part of living tissue. Although protein can give the body energy, its main

purpose is to give structure to cells, antibodies, many hormones and enzymes. Most of the protein found in the body is in the muscle tissue; the remainder is distributed in soft tissues, bones, teeth, blood and other body fluids.

Proteins are very complex chains of amino acids, such as tryptophan, aspartic and glutamic acids. The amino acids link together and form a structures like hair and nail tissue. Protein is used to repair body tissue damaged from the continual "wear and tear" or from injury or surgery. This is a function only protein can do because it alone has the building blocks of body tissue - amino acids. Protein is also used to build new tissue during growth, pregnancy and lactation. Finally, protein may be used for fuel if all other sources are depleted. However, it is not a good source of energy because amino acids require much processing. The body prefers using its carbohydrate and fat reserves for fuel. When the body does resort to using protein for energy, such as during famine, muscles and organs "waste" away.

Current dietary recommendations follow the body's needs for fuels. The base of our energy needs comes from carbohydrates (55% of total calories). No more than 30% of our energy should come from the concentrated fuel. fats. The remaining 15% of our calories coming from protein is not used for fuel but as source of amino acids. So when you "gas up" your body, choose your mix of fuels wisely.





American Dietetic Association president-elect Doris Derelian (left) appears at Dairy Council's 74th annual meeting with Jan Stanton, executive director, and Robert B. McSparran, president. Drellan spoke about the importance of the school breakfast program, which is responding to statistics that show millions of children go to school hungry everyday in America.

### Wayne County Honors **4-H Leaders**

WAYNE (Wayne Co.) - The 1994 Wayne County 4-H Leaders Workshop and Awards Luncheon was recently held at the Presbyterian chapel in Honesdale. Thirty 4-H leaders attended the function.

Leaders learned about new project materials, changes in the Wayne County Fair schedule, and revised project book judging guidelines. Wayne County 4-H staff presented a program on partnering skills and leaders were shown games and activities which they could use with 4-H members at club meetings.

This annual event is also used to honor the dedicated 4-H leaders of Wayne county. Receiving awards at this year's luncheon were the following: first year leaders: Carroll Krautter and Anna Mae Rosengrant; fifth year leaders: Julie Yatsonsky, Jean Pruss, and Linda Baldwin; ten-year leader: Mary Gries; and twenty-five year leader: Bob Muller, Sr.

For more information about joining 4-H, or possibly starting a club, contact the Wayne County Cooperative Extension office, (717) 253-5970, ext. 239.



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