



The Facts About Hormones

When the word hormone is said, it can spark a variety of thoughts and concerns. Whether it be unscrupulous athletes in the news or hormone-free labels on food, the connotation is often a negative one. A little science can go a long way in helping people understand the truth about hormones...what they are and what role they play.

Hormones are not good or bad, but are an absolute necessity for life! A hormone is defined as a molecule produced in one part of the body that sends a message somewhere else in the body. These hormone ‘messengers’ allow tissues and organs communicate with each other.

Here are some key facts about hormones:

- Virtually all your bodily functions are under some hormonal control.
- All multi-cellular organisms produce hormones, including plants. This means that virtually all plant and animal derived food contains trace amounts of hormones (except highly processed foods like sugar).
- A hormone’s ability to cause a biological effect is dependent upon its physical shape. The hormone must interact with a receptor in the body that recognizes that unique shape in order to work. The hormone and its unique receptor work much like a key fitting into a lock. Without the right receptor, the hormone will not have any effect.
- Two basic kinds of hormones:

Protein Hormones	Steroid Hormones (fat soluble)
Large molecules, cannot be absorbed	Small molecules, can be absorbed through the skin
Destroyed by digestion (therefore, must be injected to have an effect)	Survives digestion so can be consumed orally
Destroyed by cooking or heat (alters shape of the protein so it has no biological effect)	Keeps its structure and effectiveness during heat
Examples: Insulin (used by diabetic patients), Oxytocin (a.k.a. pitocin), Bovine Somatotropin, Human Growth Hormone, IGF-1	Examples: Estrogen, Progesterone, Testosterone, Vitamin D



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Questions and Answers:

- Q.** Hormones are often referred to by the media, as it relates to stories about illegal use by athletes and the detrimental impacts these substances can have on the human body. Can hormones found in food have the same impact?
- A.** No. Hormone use in animal agriculture is strictly regulated by FDA to ensure the safety of the food supply. The few hormones approved for use have undergone years of research that prove efficacy, safety to the animals, and human safety before they are approved by FDA. That process is typically even more stringent than the approval process for human pharmaceuticals.
- Q.** Do the hormones used in agriculture cause cancer?
- A.**
- No. As previously stated, the hormones used in agriculture have to go through stringent testing to be approved safe for both humans and animals by FDA.
 - Cancer occurs when the genetic machinery of a cell goes haywire caused by a carcinogen (an external substance or radiation that causes a genetic mutation) or simply by aging cells. This then causes a normal cell to grow and replicate out of control.
 - Some hormones are required for cancer growth and survival, and in fact may even be produced by cancer cells. These are the same hormones required by normal cells for survival. While required for survival, they do not cause the cancer.
- Q.** What about early breast development in girls - do the hormones used in agriculture, such as rbST play a role?
- A.**
- Hormones, such as the protein hormone rbST that is used in the dairy industry, have no impact on puberty in girls.
 - > rbST is a protein, therefore is destroyed when milk is pasteurized.
 - > It is species-specific, meaning it has a biological effect in cows but does nothing in humans.
- Q.** On average girls in developed countries today are reaching puberty 18 months earlier than their mothers, and 24 months earlier than their grandmothers. Why is this?
- A.**
- The primary trigger for the onset of puberty is weight and percentage of body fat. When the body reaches a certain percent of body fat, indicating a slow down in muscle growth, a signal triggers the complex hormonal activity that starts development of secondary sexual characteristics.
 - High caloric intake in modern diets and obesity are probably the most significant reasons for the earlier onset of puberty girls in affluent countries.
 - The phenomenon is also occurring in Western Europe where hormones such as rbST are not used in animal production.
 - Countries with high incidence of under- and malnutrition are not experiencing the same reduction in age of the onset of puberty.



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