

## Peptide Hormones

**Peptide Hormones are naturally-occurring substances that circulate in the blood and can improve muscle growth, change the balance of hormones and increase the production of red blood cells. Examples include Erythropoietin, Human Growth Hormone and Insulin.**

### Erythropoietin

Erythropoietin (EPO) stimulates the body's production of red blood cells, which carry oxygen to the working muscles, which in turn increases the endurance capacity of the athlete.

#### Side Effects

EPO use can thicken the blood causing blood clots, which increases the risk of heart attacks and stroke. Endurance athletes are particularly vulnerable as their blood is normally thicker due to dehydration.

### Human Growth Hormone

Human Growth Hormone is responsible for the normal growth and development of children into adults. It assists the body in building muscle and bone. Athletes may use HGH in an attempt to increase muscle size and strength and to aid in recovery.

#### Side Effects

Side effects include a gross overgrowth of hands, feet and facial features, acromegaly (protruding forehead, brow, skull and jaw - which can't be reversed), an enlarged heart that may result in high blood pressure and even heart failure, damage to your liver, thyroid and vision, and arthritis. Other side effects can include increased sweating, swelling of soft tissue and heart disease.

### Insulin

Insulin, normally used in the treatment of diabetes, is a hormone secreted into the blood stream to promote the metabolism of carbohydrates, fats and proteins.

Some body builders and other athletes use insulin, in conjunction with other substances, in an attempt to increase muscle growth and improve muscle definition. However, it is debatable whether insulin actually achieves these results and the chances of harmful side effects are great - deaths are alleged.

#### Side Effects

Use of insulin can cause hypoglycaemia (low blood sugar) which may cause shaking, nausea, weakness, shortness of breath, drowsiness, a coma, brain damage and death.

Although insulin is banned as a peptide hormone, it is permitted to treat insulin-dependent diabetes. Other substances with similar chemical structure or similar biological effects are also banned.

### Status In Sport

Peptide Hormones, including Insulin, EPO and Human Growth Hormone, are prohibited both In and Out of Competition under the World Anti-Doping Code 2018 Prohibited List (effective 01/01/2018). Athletes requiring the use of insulin must first seek a Therapeutic Use Exemption (TUE).

