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## Supplementation with HumaPro®: Affects upon body composition.

As discussed prior, there is very little validated information available in relation to the human metabolic pathways of both amino acids and whole proteins in regard to NNU, gluconeogenesis, catabolism and effects upon body composition. The pathway of substrate metabolism often affects hormonal levels and responses in a cascade or matrix manner rather than a simple linear action/reaction scenario. Too often the linear pathway is the most commonly assumed for supplemental and pharmaceutical preparations. In this study the intent is to validate insulinogenic response to a complete protein supplemental preparation containing the 8 essential amino acids, fractional insulinogenic and cortisol inhibiting substrates known as HumaPro®.

### Back Ground:

Fractionation of an herbal extract in the test product HumaPro® was previously validated as manifesting both insulinogenic and lipolytic qualities. Thus in theory a BG decrease from ingestion would significantly support potential proteinaceous tissue anabolism due to increased amino acid up-take without an increased in stored adipose tissue. When exogenous insulinogenic compounds are introduced to the system there is a distinct reduction in endogenous insulin release in response to substrates known to commonly elevate plasma insulin levels.

Insulin is a transport and storage hormone produced by the pancreas that facilitates glucose up-take or disposal in various forms:

1. Storage in proteinaceous tissues in the form of glycogen to fuel ATP production.
2. Storage in adipose tissue

\* The pancreas is a gland organ in the digestive and endocrine system of vertebrates. It is both an endocrine gland producing several important hormones, including insulin, glucagon, and somatostatin, as well as an exocrine gland, secreting pancreatic juice containing digestive enzymes that pass to the small intestine.

These enzymes help in the further breakdown of the carbohydrates, protein, and fat in the chyme.



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## Preparation:

With the intent of maintaining a standard the same 9 subjects were utilized in both the current study and one prior for multiple tests relating to insulin. The 9 subjects ranged in age from 18-50 years of age were pre-tested for normal insulin function and glucose disposal and for drug or supplemental use that may alter study results. All subject fasted for 12 hours pre-testing in a double blind cross over study. Blood samples were taken 15 minutes pre-ingestion, 30 minutes post ingestion and 2 hours post ingestion.

## Results:

Product Ingested	Pre-Ingestion	30 minutes Post	120 minutes Post
75g Dextrose	79mg/dl +- 4mg	130mg/dl +-5mg	147mg/dl +-4mg
10 tablets HumaPro®	85mg/dl +- 3mg	75mg/dl +- 2mg	70mg/dl +- 3mg

## Conclusions:

Insulin is one of the most anabolic hormones in human physiology. It facilitates storage or transport into cells of nutrients including amino acids (from protein), fats and carbohydrates in most human tissues including organs, muscle and adiposities. HumaPro® does not hold the same potential as there is a distinct lack of increase in blood glucose from ingestion. This is likely due to near zero waste utilized for caloric storage and the supplements formulary providing a synergistic lipogenic insulin analog that facilitates amino acid up-take into proteinatious tissues for anabolism {2}.

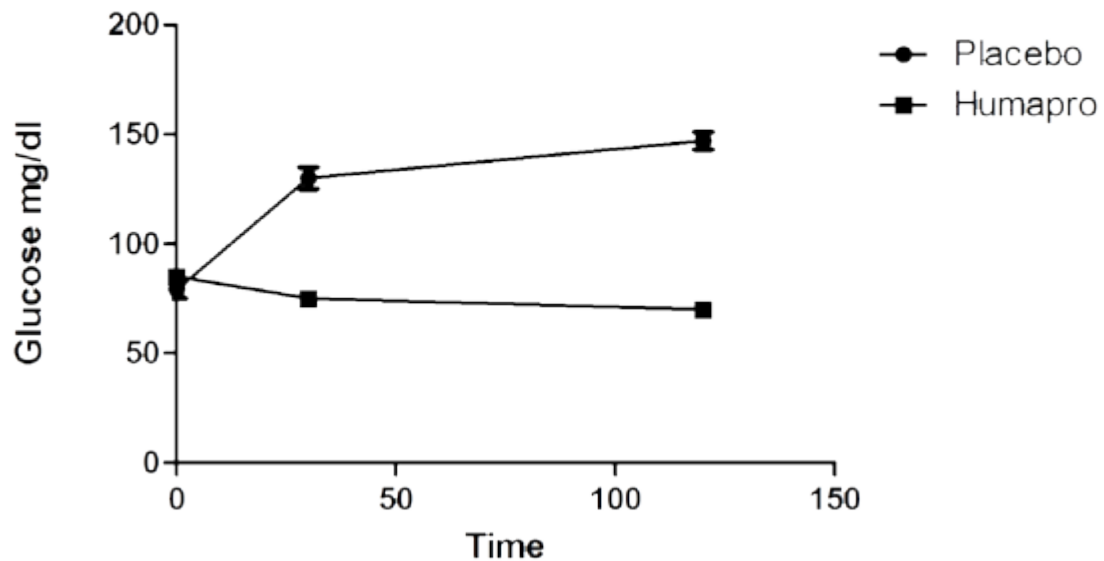
## Data Analysis (Provided by Bioanalytical Research Group):

The following analysis of 9 subjects represents whether or not HumaPro® supplementation has any significant effects differing from placebo on blood glucose (BG) levels. The data was analyzed using a 2 way ANOVA factored for both time and supplementation group. Statistical significance was set for  $p < 0.05$  with a 95 % Confidence Interval.

For both mean glucose levels and time, there was a statistically significant difference ( $p < 0.001$ ) between both groups. As illustrated in the graph below, it is apparent that HumaPro® posses anti-hyperglycemic effects due to its glucose lowering effects in response to the dextrose challenge. This data offers preliminary information for a larger study utilizing a repeated measures design using an OGTT (oral glucose tolerance test) approach to illustrate HumaPro®'s exogenous insulinogenic effects upon glucose modulation.



## Glucose responses in control and experimental group



In addition, it appears that HumaPro® has a time dependent action and thus based on this exploratory analysis, HumaPro®'s antihyperglycemic effect peaks at 120 minutes.

### Mode of action hypothesis:

Momordica Charantia is a well known fruit that has many medicinal values. It is often used in East Africa, Asia, South America, and India for the treatment of diabetes. Further analysis of this compound has shown that it contains a specific polypeptide that possesses Insulin-like properties and function when properly prepared and extracted. In addition, it appears to lower insulin serum levels, promote glucose utilization in the liver, and enhance insulin sensitivity (via a synergistic action with coffee bean extract). These factors typically aid in nutrient shuttling towards muscle tissue and less towards adipose tissue. Therefore, the net result would be improved body composition and uptake of nutrients such as amino acids toward muscle.



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