



## Protein and Amino Acids

### Raw Material

**VIDOGUM PRO 180** and **VIDOGUM PRO 200** is derived from the carob seed of the wild 'Ceratonia siliqua L.' tree. The carob germ protein is very rich in amino acids, protein and soluble and insoluble fibre.

Origin: Mediterranean countries.

### Production

The carob germ protein is isolated from the seed using a physical process only.

### What is Carob Germ Protein

The seeds of the fruit of the carob trees have long been exploited predominantly to obtain locust bean gum (LBG), which is used in the food, pharmaceutical and cosmetic industries because of its ability to form viscous solutions and to stabilize emulsions and dispersions. Also, the pod can be ground into flour and used as a chocolate or cocoa substitute.

The alternative protein market is growing at a rapid pace, for a variety of reasons. Alternative sources of protein are having a profound influence on the formulation of weight conscious food and diets based on low glycaemic index (GI) and high protein intake, and traditional manufacturers are looking at new protein sources as a means of enriching their products.

### Characteristics

**VIDOGUM PRO 180 / VIDOGUM PRO 200** (Carob Germ Protein), are raw food proteins derived from the carob seed and have a similar amino acid profile to soy protein with 54% protein. They are rich in soluble and insoluble fibre and have a nutty flavour.

**VIDOGUM PRO 180 / VIDOGUM PRO 200** are gluten and allergen-free and suitable for vegetarian and vegan diets.

The protein content is between:

40-50 % in **VIDOGUM PRO 180**

50-55 % in **VIDOGUM PRO 200**

**VIDOGUM PRO 180 and VIDOGUM PRO 200** are very rich in glutamic acid and arginine. They fit the FAO/WHO standard protein recommendation for the essential amino acids: leucine, lysine, Isoleucine, valine, threonine and phenylalanine.

## Typical Amino Acid profile:

| Amino Acid               | mg/g crude protein |                      |        |
|--------------------------|--------------------|----------------------|--------|
|                          | Requirement WHO    | Value in LBG Protein | Factor |
| Isoleucine               | 28                 | 37                   | 1      |
| Leucine                  | 66                 | 63                   | 0.95   |
| Lysine                   | 58                 | 58                   | 1      |
| Total sulphur Amino Ac.  | 25                 | 29                   | 1      |
| Total aromatic Amino Ac. | 63                 | 104                  | 1      |
| Threonine                | 34                 | 36                   | 1      |
| Tryptophan               | 11                 | 13                   | 1      |
| Valine                   | 35                 | 42                   | 1      |

## Functional Potential / Applications

**VIDOGUM PRO 180 / VIDOGUM PRO 200** could be used as an alternative raw material and incorporated as an ingredient in new food formulations. Their antioxidant properties make it a potentially interesting ingredient for functional foods and a low-cost alternative for other proteins.

**VIDOGUM PRO 180 / VIDOGUM PRO 200** are of great interest in gluten-free breadmaking for their ability to form a gluten-like network, due to the presence of carobin, the group of proteins with different sizes and polymerization degrees, which acts as an elastifying agent especially in gluten-free doughs or batters. They are a low-cost competitor to other food proteins, like dairy or soy protein, commonly used in gluten-free bread.

Addition of **VIDOGUM PRO 180 / VIDOGUM PRO 200** to wheat flour is of interest as their carobin possesses functional properties similar to wheat gluten, strengthening the dough and adding stability during mixing.

Suitable for protein-enriched bars and drinks, and in processed meat, dressings and sauces.

Emulsification properties can be achieved if sheared intensively to achieve activation. This emulsion is stable over months at room temperature.

The emulsions show a unimodal droplet size distribution with a D50 value typically at 8-10 µm. Emulsification is achieved within 2 to 3 minutes (oil load 50%).

Typical dosage ratio is 1/20 protein/oil.