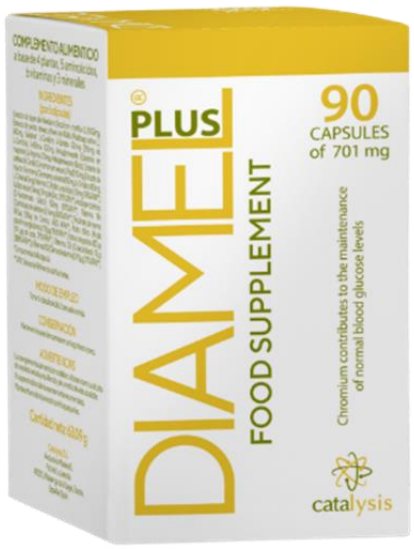
DIAMEL PLUS® CAPSULES



PLUS
Gymnema leaf extract
Chromium
Iodine
Vit D3

Table 1. Qualitative and quantitative composition of DIAMEL PLUS® CAPSULES.

Composition	mg/ capsule
Bilberry extract (*Vaccinium myrtillus L.*)	217 mg
Alfalfa extract (*Medicago sativa L.*)	140 mg
L-carnitine L-tartrate	71 mg
L-Glycine	70 mg
Magnesium stearate	39,87 mg
L-Arginine	35 mg
Talc	27.12 mg
Cinnamon extract (*Cinnamomum cerum J. Presl*)	25 mg
Gymnema leaf extract (*Gymnema sylvestre*)	25 mg
L-Ornithine	17,5 mg
L-Cysteine	13.83 mg
Vitamin C (L-ascorbic acid)	9.83 mg
Zinc sulphate	6 mg
Pantothenic acid (calcium pantothenate)	0.86 mg
Vitamin B6 (Pyridoxine hydrochloride)	0.26 mg
Chromium picolinate	80 µg
Folic acid (Pteroylmonoglutamic acid)	32 µg
Potassium iodide	26.16 µg
Vitamin D3 (Cholecalciferol)	3.16 µg
Vitamin B12 (Cyanocobalamin)	0.155 µg

Insulin resistance is a condition in which the body's cells do not respond adequately to insulin, a hormone crucial for the regulation of blood glucose levels. This resistance can lead to elevated blood glucose levels and, over time, the development of pre-diabetes and type 2 diabetes among other complications.

Oxidative stress plays a significant role in the development and progression of insulin resistance. This phenomenon occurs when there is an imbalance between the production of reactive oxygen species (ROS) and the body's ability to neutralise them with antioxidants. The accumulation of ROS can damage cells and tissues, contributing to inflammation and dysfunction of β-pancreatic cells, resulting in reduced insulin sensitivity. Factors that increase oxidative stress include exposure to environmental pollutants, tobacco consumption, poor diet, and lack of physical exercise.

Insulin resistance can lead to a number of serious health complications, including:

- **Type 2 diabetes**: Insulin resistance is a major cause of type 2 diabetes. Over time, the pancreas can become exhausted from producing extra insulin to compensate for the resistance, leading to elevated blood glucose levels.
- **Cardiovascular disease**: Insulin resistance is associated with an increased risk of cardiovascular disease due to its impact on blood lipid levels and blood pressure.

- **Fatty liver**: Fat accumulation in the liver is common in people with insulin resistance, which can lead to non-alcoholic fatty liver disease.
- **Metabolic syndrome**: This syndrome includes a combination of conditions such as abdominal obesity, hypertension, high triglyceride levels and low HDL cholesterol levels, all related to insulin resistance.
- **Polycystic Ovary Syndrome (PCOS)**: PCOS is an endocrine-metabolic disorder that affects women of reproductive age. It is characterised by ovarian cysts, menstrual irregularities and elevated androgen levels. Insulin resistance is a common feature in women with PCOS, regardless of their weight. This resistance may contribute to hyperinsulinaemia, which in turn exacerbates androgen production, aggravating PCOS symptoms.
- **Hypertension**: Insulin resistance may contribute to high blood pressure, as insulin has vasodilatory effects and insulin resistance can lead to increased blood pressure.
- **Dyslipidaemia**: Insulin resistance is associated with abnormal blood lipid levels, including elevated triglycerides and low HDL cholesterol levels.

Antioxidants are compounds that can neutralise ROS, thereby reducing oxidative stress. Their use has been shown to be beneficial in improving insulin sensitivity and regulating blood glucose levels. Antioxidants can help protect β-pancreatic cells, improve endothelial function and reduce chronic inflammation.

DIAMEL PLUS® CAPSULES, designed by Laboratorios Catalysis S.L., is a functional food supplement containing antioxidants, minerals and plant extracts that contribute to normal glucose metabolism, especially in patients with insulin resistance.

The biological properties of the main ingredients are:

Bilberry extract (*Vaccinium myrtillus***).** Bilberry extract contains anthocyanins which help improve insulin sensitivity, promote glycaemic control through glucose uptake in peripheral tissues. It contributes to the proper functioning of β-pancreatic cells. It has inhibitory properties of the enzyme α-amylase. [1,2,3,4]

Extract of aerial parts of Alfalfa (*Medicago sativa L.***).** Alfalfa has antioxidant properties that help to improve insulin sensitivity, and promotes a reduction in postprandial blood glucose levels in the blood in diabetic patients. It is a source of choline, which contributes to memory and nervous system function. [5,6,7]

L-Carnitine L-tartrate (LCLT**).** L-carnitine L-tartrate is a source of L-carnitine combined with tartaric acid with improved absorption and bioavailability of L-carnitine. L-carnitine contributes to fatty acid metabolism and promotes insulin sensitivity. It has antioxidant properties and improves cardiovascular function [(8,9).]

L-Glycine. Helps to restore creatinine levels**.** Promotes the release of glucagon, a hormone that facilitates the conversion of glycogen into glucose to regulate blood glucose levels. Helps in the treatment of gastric hyperactivity. [10,11,12]

L-Arginine. Promotes endothelial function and insulin sensitivity through nitric oxide production.[13,14,15]

Cinnamon extract (*Cinnamomum cerum J. Presl*.). Promotes insulin sensitivity, helps blood glucose uptake and lowers blood glucose levels. It promotes insulin receptor activity. It also has antioxidant properties that help to reduce oxidative stress and inflammatory processes.[16,17]

Gymnema leaf extract (*Gymnema sylvestre***).** Studied for its benefits on glucose metabolism. Its high content of compounds such as gymnemic acids helps reduce intestinal glucose absorption. Helps stimulate the regeneration of β-pancreatic cells. Contributes to the improvement of insulin sensitivity.[18,19,20,21,22]

L-Ornithine. Promotes insulin sensitivity by reducing ammonia levels in the body as an intermediary in the urea cycle, helping to

regulate blood glucose levels. Promotes insulin secretion [23,24].

L-cysteine. It is a precursor of glutathione, helping control oxidative stress. Helps reduce insulin resistance. Improves insulin sensitivity, promoting glucose uptake. It also participates in the detoxification of harmful compounds in the metabolism of amino acids and proteins. [25,26,27]

Vitamin C (L-ascorbic acid**).** It is a powerful antioxidant that helps to reduce oxidative stress processes, and with it, insulin resistance. It promotes insulin sensitivity. Promotes iron absorption [28].

Zinc sulphate. Zinc is essential for the formation, storage and release of insulin in β-pancreatic cells. It promotes insulin sensitivity. In addition, its antioxidant properties help to reduce oxidative stress and improve glycaemic control.[29, 30]

Pantothenic acid (calcium pantothenate**).** It is a key component of coenzyme A (CoA), promoting glucose metabolism. It promotes the synthesis of hormones such as insulin. In addition, its antioxidant properties help reduce oxidative stress.[31,32]

Vitamin B6 (pyridoxine hydrochloride**).** Pyridoxine acts as a cofactor in enzymatic reactions that regulate the metabolism of glucose, lipids, amino acids, DNA and neurotransmitters. Its antioxidant properties help reduce oxidative stress. It is involved in homocysteine metabolism. It promotes insulin sensitivity.[33]

Chromium picolinate. Chromium helps to improve insulin sensitivity, promotes fasting and postprandial blood glucose control, especially in type 2 diabetes. In addition, its antioxidant properties help control insulin resistance.[34,35]

Folic acid (pteroylglutamic acid**).** It is involved in homocysteine metabolism, which is essential for cardiovascular health, as well as insulin sensitivity. Helps improve glycaemic control [36,37,38.]

Potassium iodide. Iodine is essential in the synthesis of thyroid hormones (T3, T4), improving glucose metabolism and insulin sensitivity. [39,40]

Vitamin D3 (Cholecalciferol**).** Helps to improve insulin sensitivity, promoting glycaemic control. Influences the function of β-pancreatic cells, promoting insulin production. It has anti-inflammatory properties that help reduce chronic inflammation. In addition, vitamin D3 regulates translocation of the glucose transporter GLUT4 and glucose utilisation in adipocytes.[40,41,42]

Vitamin B12 (Cyanocobalamin**).** It is essential in the conversion of carbohydrates to glucose in energy metabolism. It is necessary for DNA synthesis and maintenance of cell function, especially in β-pancreatic cells. It helps improve insulin sensitivity and supports glycaemic control.[43]

INSTRUCTIONS FOR USE

Adults: Take 2 capsules every 8 hours, before the 3 main meals of the day.

Remarks: Take 15 minutes before meals, on an empty stomach.

SAFETY AND WARNINGS

Contraindications: Hypersensitivity to any of the components of the product.

Storage: Store in a cool, dry place, away from direct sunlight and out of the reach of children.

Supplements should not be used as a substitute for a varied and balanced diet.

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