**1). Discussion and research on the nutritional and health functions of lecithin its development prospects.**

Lecithin is a pure natural health food, mainly found in the cells of animals and plants, and is the main component of biological cell membranes. Animals with higher content include hearts, livers, brains, kidneys, bone marrow, and eggs. In plants, the content is more concentrated in oilseed crops, such as soybean seeds with a lecithin content 1.2% to 3.2%, and peanutcithin with a content of 0.44% to 0.63%. Therefore, natural lecithin is mainly obtained from legumes and legume products. Currently, the commercially available soy lecithin uses advanced extraction, degumming, and low-temperature refining processes to extract it from soybeans. The pure product is a light yellow (or brown) powder. Soy lecithin is the third type of nutrient in soybeans apart from proteins and fats. Its main components are lecithin, phosphatidylcholine, and inositol phospholipids, all of which are essential nutrients for the human body. According to scientific research, about 40% of the dry matter in human brain tissue is composed of phospholipids. Phospholipids are indispensable substances in the composition of human cells. At the same time, lecithin is also the main source of obtaining trace elements (P) in the human body.

**2). How to apply lecithin in baked goods**

Through chemical and enzymatic treatment, lecithin enhances its emulsifying properties and dispersibility in aqueous systems, making it an important natural emulsifier widely used in baking products.

Dough adjustment and texture improvement agent: Lecithin increases the toughness of the dough, and its hydrophilic properties increase the viscosity of the dough during flour hydration. It can also improve the texture of products processed by chemical fermentation, ultimately improving their symmetry, volume, granularity, surface appearance, and texture. In frozen dough, it can protect yeast, increase volume, facilitate dough extrusion molding, and extend the processing period. When making pie crust, it can increase softness, smoothness, and rollability, preventing cracking. In cakes, it produces a finer and more uniform particle structure and reduces the occurrence of open air pockets, preventing the development of internal channels and reducing product hardness. In cookies, it increases mixability, spreadability, and improves the appearance and color of the product. Recommended usage: 0.25% to 1% based on flour weight.

Emulsifier and soft preservative: Lecithin molecules have a phosphorus-containing polar group that can form inclusion complexes with linear starch, and this polar group makes the entire molecule more easily dispersed in water than monoglycerides, for example. characteristic makes lecithin highly emuls and water- and gas-holding. It can also moisture from evaporating from the product during storage, increasing the softness of the crust, preventing drying and cracking, and extending shelf life. In bread and pastries, it increases viscosity, improves crumb structure, retains air to increase volume, and imparts better softness and shelf life to the product. In cookies, it has a dispersing effect, improves moisture absorption, enhances crispiness, and reduces dryness. In chocolate, it acts as an emulsifier, preventing particle aggregation and sugar bloom. Recommended usage: 0.75% to 1% based on flour weight.

Extender, mold release, and antioxidant: Lecithin increases the lubricity of extendable food products. It increases the throughput of the product through processing machinery and reduces cleaning time without reducing product density. It can greatly reduce cleaning time for cutting blades. It enhances the texture of finished products, making the structure more refined and softer. In flat pan oils and aerosol spray release products, a low content of lecithin is sufficient to reduce the caloric of the food, making it more effective for products that do not require browning. In cakes and candies, it acts as a mold release agent, facilitating separation from heating elements and preventing scorching and carbonization. In fried foods, it prevents the oxidation of vitamin A, helps preserve vitamin E, and acts as a splatter inhibitor. In low-fat foods, it increases lubricity and increases yield. Recommended usage: 2 to 3% based on oil weight.

**3. The composition and sources of soy lecithin**

Lecithin is a type of phospholipid compound that contains phosphorus. It usually consists of a mixture of phosphatylcholine (PC), phosphatidylethanolamine (PE), phosphatidylinositol (PI), phosphatidic acid (PA), phosphatidylserine (PS), and other phospholip. The most typical ones are the first three.

Lecithin is a complex component of glycerides, which can be hydrolyzed to yield compounds such as glycerol, fatty acids, phosphoric acid, choline, ethanolamine, and inositol. The fatty acids in soy lecithin molecules are generally oleic acid, stearic acid, palmitic acid, linoleic acid, and arachidonic acid. Lecithin is widely found in soybeans, peanuts, sesame seeds, eggs, livers, brains, and other animal and plant bodies, from which it can be extracted. Because soybeans are a globally important crop, and the northeast region of China is known as the "homeland of soybeans," the most extensive and economically valuable source of lecithin is from soybeans. We call it "soy lecithin," which is widely used in medicine, food, feed, and other industries. Soy lecin is a colloid separated during the refining process soybean oil and is an important by-product in the oil industry. Soybeans contain 1.2%~3.2% lecithin, which is separated as hydrated lecithin during the degumming process. Through processes such as extraction and refining, soy lecithin series products can be obtained, including concentrated soy lecithin, refined soy lecithin (refined concentrated lecithin, powdered soy lecithin), phosphatidylcholine (PC), phosphatidylinositol (PI), etc.