# Gluten free foods from pseudocereals

## Development status

**Phase 2**

**Feasibility study.** There is a realistic design of the technology and the initial tests in the laboratory are leading to the specification of the technology requirements and its capabilities.

## IP protection status

Czech utility models 31079, 31080, 32947

## Partnering strategy

*Collaboration, licensing*

## Institution

**Food Research Institute Prague**

## Challenge

In terms of nutrition and energy, cereals and cereal products are irreplaceable to humans. Classical cereals contain gluten, which is healthy for healthy people, but it is toxic for individuals suffering from intolerance (celiac disease, gluten allergy, non-celiac gluten sensitivity). At the same time, these people are not allowed to consume wholemeal products from classical cereals and therefore have to use other raw materials - gluten-free pseudocereals such as buckwheat, quinoa, amaranth, tef, sorghum etc. Nowadays, the portfolio of gluten-free products is becoming broader, however their composition is dominated by various (gluten-free) starches instead of good-quality cereals. They have often small amino acid content. Thickeners are often used in mixtures. However, the present recipes show the use of mixtures of gluten-free pseudocereal flour blended in such a ratio that allows good technological processing and a balanced taste of the resulting product.

## Description

The technology is based on several recipes with gluten-free pseudocereals containing amino acids. These cereals can be mixed in such a proportion that they ensure a balanced taste of the product and their technological processing is simple. 1) A mixture for gluten-free pancakes containing smooth white rice flour, native smooth buckwheat flour, flour selected from the group of sorghum flour, white quinoa flour and / or smooth amaranth flour, and a mixture containing sugar and sunflower lecithin. 2) The gluten-free cereal mixture in bulk contains pseudocereals in extruded or flake form, nuts and seeds, as well as dried fruits. 3) Gluten-free biscuits salted from pseudo-cereal flour contain soft curd, pseudo-cereal flour, legume or gluten-free cereal flour, flax fiber, eggs, vegetable fat, guar gum, herbs and salt. All submitted recipes were tested and sensory evaluated by a panel of experienced evaluators.

## Commercial opportunity

1) The product contains sunflower lecithin, which has positive effects

on the human body, is important for the brain and helps in lowering cholesterol levels. Lecithin also helps in baking, facilitates kneading and is especially useful for gluten-free dough. It also improves the durability and taste of the bread. The mixtures do not contain free fats, but on the other hand they contain a high proportion of quality amino acids, thereby increasing their nutritional value. Pseudocereals are sources of proteins with balanced amino acid composition and also sources of polyphenols with significant antioxidant activity. They are also source of valuable omega unsaturated acids, minerals and vitamins (mainly of group B). Rice is the most widespread cereal in the world, its flour is easy to digest, has a low sodium content and is a good thickener. 2) The ingredients are not roasted or glued with syrup. They also contain no hardened fats and are not sweetened. On the other hand, they contain a high proportion of high-quality amino acids and valuable omega unsaturated fatty acids. They increase their nutritional value and are suitable for the prevention of civilization diseases. The present mixture is a cereal in the flavorless form. The taste is formed by the present dried fruit and in a loose form without the use of syrups and without roasting. The cereal mixtures are suitable for incorporation into milk or non-dairy drinks based on nuts or soya, optionally in yoghurts or for direct consumption. 3) Due to its high nutritional value the product is suitable for children and adults suffering from gluten intolerance, but also for healthy individuals to diversify their diet. Also it is suitable as a source of fiber or for people with higher blood pressure. Its composition is balanced, containing all the major nutrients, fiber and lower salt content, which has a positive effect on human health. Celiacs and people who have serious problems due to gluten is about 1%.