Improving sustainability with powdered goods

How powdered products can solve the world's food challenges

by Stephen Harding, Managing Director, Gough Engineering, UK

At the latest estimate, 815 million people were undernourished in 2017, a figure that is increasing year on year. With more food challenges on the horizon, global food experts are now considering powdered food as a way to fulfil the world's nutritional needs. Here, Stephen Harding, Managing Director of materials management specialist Gough Engineering, explains how powder manufacturers can maximise efficiency and improve powder output.

There is a huge disparity in the world's population in terms of nutritional intake. 1.9 billion adults are overweight or obese, while 462 million adults are underweight. But this isn't just a problem of quantity of food; quality plays an impact.

The World Health Organisation includes inadequate vitamins or minerals as part of its definition of malnutrition. Micronutrient-treated malnutrition, as it is referred to, means that the body is not able to produce enzymes, hormones or other substances that are essential for growth. A lack of iodine, vitamin A and iron pose the biggest threat to the health of children and pregnant women.

Food poverty will more than likely increase in years to come. Both the quantity of food available and its nutritional value are expected to decline with the threat of climate change affecting traditional agriculture patterns. According to The State of Food Insecurity in the World 2015, a large majority of the 775 million people in low and middle-income countries that are unable to meet their minimum daily dietary requirements, work in agriculture and fishing themselves.

This means that with increased natural disasters or meteorological events such as flash flooding or increased tropical storms, they could not only lose their livelihood but also their way of feeding themselves and their communities. This means that to sustain populations that are increasingly affected by freak weather conditions due to climate change, alternative ways of feeding these populations need to be considered.

Powder to the people

The World Food Programme (WFP) lists a range of specialised nutritious foods that it provides to improve nutritional intake in the communities that it assists. These include fortified blended foods (FBFs) that are partially precooked and milled cereals, soya, beans or pulses, all fortified with micronutrients. They are used to prevent and address nutritional deficiencies.

Micronutrient powders are also used, which contain the daily intake of 16 vitamins and minerals for one person. These are sprinkled onto hot meals, usually in school feeding programmes that provide hot meals to children, in cases where nutritional needs cannot be met through these food sources.

From these examples, it is clear to see that powders are commonly used by relief agencies in disaster-hit countries. People already suffering with the effects of poverty, and therefore poor nutrition, are then impacted further by the loss of food supply following a crisis.

Powders are also being used in more prosperous countries to readdress what powdered meal-replacement manufacturer 'Huel' calls "inefficient, inhumane and unsustainable" modern food production methods. Many people in Western countries find themselves too busy to make nutritionally balanced meals and are increasingly turning to powdered meal replacements to fulfil their dietary needs.

With the growth of the powdered food market no longer limited to protein supplements for bodybuilders, manufacturers must consider the quality of their processes to ensure that they can keep up with the demand, from the world's richest to the world's poorest people.

While manufacturers in the pharmaceutical and plastics industries have dealt with the challenges of powder handling for years, food manufacturers diversifying into powdered products will now have to reassess their handling processes to ensure that they still output a quality product at a consistent rate.

The key challenge for powdered product handling is screen blinding. This is where the open area of a screen is decreased due to the product coating or plugging the mesh instead of allowing

it to clear through. Powders such as powdered milk often clump together, which will lead to blockages in the mesh and downtime to remove and clean it, if the equipment is not correctly chosen for the application.

A sieve or screen needs to be used to ensure a quality output of powder, making sure that the granules are the same size. These could vary from 0.2mm to 4mm, so it is essential that the right mesh be used to screen the products.

Not only is the mesh size vital for quality output, using ultrasonic technology can also help to clear blockages from the mesh quicker, before an engineer must stop the process. An ultrasonic screening system will use high frequency vibrations to rapidly shake the powder during the screening process. At up to 20,000 hertz, the vibration will then help the granules to pass through the mesh.

To cope with the increasing demand for powdered products in sectors that may not have previously used them, food manufacturers need to ensure that their product will be handled as efficiently as possible. By rethinking their existing handling systems, or retrofitting ultrasonic screening systems to their existing equipment, they will be able to manage the special demands of powder production.

While powders may not be the way to improve food supply chains for decades to come, they do play an essential role in providing vital supplements to the world's poorest and will continue to grow in use in the world's richest countries as a quick, convenient source of nutrition. It is therefore wise for food manufacturers to take heed of the handling needs of powder production when looking to diversify into emerging markets.

About Gough Engineering

Gough Engineering is a UK market leader in the design, supply, installation, commissioning and after sales service of bucket elevators, vibrating sieves, feeders and conveyors. The company has developed bespoke solutions for a vast range of production processes within its market leading sectors of food production, chemicals and pharmaceuticals, recycling product recovery and plastics.