



# MAIZE

## Innovative technology to answer the growing demand for higher quality products

by Tino Böhm, Head of Business Unit Wheat & Rye and Selin Bürgis, Product Management & Marketing Communications at Bühler Switzerland

**Maize is considered one of the world's most important staple foods and is the largest consumed grain today. With the entry of traditional and specialised products into new markets as well as evolving consumer trends, the potential of maize continues to grow. With the help of Bühler's expertise and innovative processing technology, the demands of this growing market can be met.**

**M**aize is a truly global food enjoyed by millions of consumers. More than a billion tons of maize are harvested every year. Of these, 175 million tons are manufactured into classic milling products such as flaking grits for the production of corn flakes, brewers grit for beer and spirits, snack grits for tasty in-between meals, breakfast cereals and main meals, and flours used for baked goods and traditional dishes such as polenta in Italy and the Balkans.

Dishes like tacos, tortilla chips and arepas from Latin American are growing in popularity around the world. Maize-based products are also growing in demand as a healthy gluten-free substitute for conventional staples. Even in Western Europe, where maize has tended to be seen as an ingredient for animal feed, new products have entered the consumer food markets.



## New trends are fueling demand

One of the biggest drivers in demand for maize is the increase in demand for gluten-free products. Whereas only recently such products occupied just a small space in the specialised foods section of supermarkets, today gluten-free products fill entire aisles. Once reserved for consumers with special dietary needs, they have long since entered the mainstream.

The retail volume of gluten-free baked goods has increased from 173,500 tons in 2015 to 355,000 tons in 2020. Growth from 2015 to 2025 is projected to be 146 percent. It's the same story for gluten-free pasta products.

Consumers opting for healthier or gluten-free diets are just one reason why maize has become such an important ingredient in the food market. Brewers are also driving demand as they look for ways to cut down on cost.

Many are replacing malt with maize as a price-efficient alternative. Craft breweries are also experimenting with the new ingredient and developing new tastes for their consumers. During the Covid-19 pandemic, these trends have accelerated.

Another important factor is the rise of snackification. Time-poor consumers demand convenient, tasty and healthy foods that fit in their busy schedules. Traditional and new maize-based products are not just practical but also meet modern consumer tastes and serve our well-being.

## Higher yields and food safety standards

On the supply side, unprecedented growth and increased yields have had an impact on the market. Today it is becoming increasingly challenging to source high quality maize because growing demand has pushed seed producers to create breeds that produce higher yields.

These varieties tend to become softer, putting more pressure on the dry milling industry to process maize into a diverse range of high-quality products that meet consumer expectations.

Bühler's longstanding experience and expertise in maize processing provides the best technological solution to answer increased demand, efficiently process a broad spectrum of product varieties with specific operating parameters and manage quality challenges. Bühler's solutions enable food processors to maximise yields, maintain high food safety standards and extend the shelf life of their products.

Indeed, food safety is an area of growing focus. In recent years aflatoxin contamination of maize, which has been linked to global warming, has increased significantly.

Traditional colour sorters that remove discoloured grains tend to impact yield by removing more grain than necessary. Bühler's LumoVision system accurately detects infected grains providing a safe and efficient solution to a growing global problem.



## More sustainable solutions

A further challenge is how to meet the increasing demand with sustainable solutions. Each of the diverse local product varieties requires specific process parameters. In the traditional nixtamalisation process of tortillas, chips and taco shells, for example, maize is cooked in lime water for several hours before the grinding process begins.

This is how the characteristic taste is achieved. But taste comes at a cost – 1500 litres of water is needed to process 1000 kilograms into nixtamalised maize flour. As this water is very high in alkaline and contains a lot of fibre and starch, it needs to be treated in a wastewater purification plant prior to being released back into the environment.

To address this challenge, ten years ago Bühler started looking into sustainable solutions for nixtamal

## Prime Masa

Technology for waste water free solution for traditional Nixtamal flour



maize flour processing and developed a new process based on steaming to replace the traditional water cooking process.

This solution is marketed today by Bühler as Prime Masa. The Prime Masa Nixtamal process uses advanced steaming technology to optimise the process. Maize is cleaned and degerminated before the maize grits are treated with lime water and steamed.

After the steaming process the maize grits are first passed through a flaker before they enter the drying and cooling process. The grits are then ground into fine maize flour.

The Prime Masa process is more sustainable and efficient, without altering the taste of the end-product. According to Bühler's initial process assessment, 84 percent of water and 52 percent of energy can be saved in the cooking and drying process, while waste is reduced by 96 percent.

A further assessment, validated by SGS Tecnos SA, has demonstrated that there is also a beneficial impact on CO<sub>2</sub> emissions. The Prime Masa process reduces CO<sub>2</sub>e emissions per kilogram of maize flour from 0.93 to 0.79 kg. These results support progress toward Bühler's global sustainability goal to cut energy usage, water consumption and waste by 50 percent along customers' value chains.

The proven technology has been successfully in operation at a plant in the US for five years. In India an additional plant started operations in July 2021 in response to the growing demand for tortilla chips and snack foods.

In order to further drive innovation, Bühler's food application center in Minneapolis has been developing and optimising the leapfrog technology since 2019.

### A newcomer with real potential

Tortillas and tacos are already familiar almost the world over, but now another maize-based product is entering markets. For breakfast, lunch and dinner, or as a convenient snack on the go, arepa, which originates from Venezuela and Columbia, is taking the world by storm.

As millions of Venezuelans emigrate to countries around the world, they are introducing the tasty maize discs to new markets. Arepa consumption is increasing in traditional south American markets as well in Europe, South Africa and even the Chinese market is predicted to grow. In response to this growing demand, milling plants have been remodeled and new plants and production lines installed.

Bühler's integrated production lines are specifically designed to reach benchmark quality and cover all aspects of the maize processing operation. The pre-cooked arepa flour requires a specialised process to achieve a high degree of gelatinisation. During the intake of raw materials impurities such as small stones, sand, and defective grains are safely removed.

The degermination process removes bran and germ to adjust the specific end product requirements. Bühler's flaking lines consistently deliver the highest pressure required to produce a uniform product such as arepa.

The extraordinary growth in the traditional and new markets and evolving new consumer trends present operators in the maize industry with opportunities and challenges. Bühler's proven expertise in traditional and novel processing technology equips millers with the tools they need to efficiently achieve highest yields and meet consumer expectations.

The environmentally friendly processing of maize products ensures maximum sustainability and efficient handling of valuable resources with tangible benefits for operators, consumers and our planet.