

REDUCED CO₂, SAME GREAT TASTE? BARLEY

Brewers use enzymes to help increase their productivity, and Novozymes meets brewers' needs with cutting-edge innovation. Novozymes' latest innovation, brewing great-tasting beer using 100% barley, empowers brewers to creatively cut down on the CO₂ emissions associated with their production. Together with Harboe, a Danish brewer, Novozymes explored the benefits offered by this revolutionary new solution.

Novozymes' enzyme solutions are nothing new to the brewing community – for decades, Novozymes Termamyl® has been the solution of choice for controlling costs in cereal cooking and improving yield. Novozymes Ultraflo® Max was rapidly embraced as the best beer filtration solution since its launch in 2007, and the Novozymes Ceremix® product line has become the standard to improve productivity when using malt and adjuncts of varying quality.

And using enzymes is certainly nothing new to Harboe, which was one of the first breweries to openly use nature's own catalysts to enhance its processing. The company's relationship with Novozymes has spanned over 30 years.

"We've used Novozymes' solutions to assist with our clarification and filtration processes, and we recently ran trials with Novozymes Attenuzyme® Flex," says Bernd Griese, President and CEO of Harboe Brewery. "We really wanted to work more with barley rather than malt, mainly due to the varying quality of malt, so we were naturally eager to join Novozymes on this exciting project."

Both companies' long tradition of innovation and originality helped to cement their strong relationship. Harboe has been working successfully with enzyme technology for years, which made this partnership an obvious one.



A barley sprout that inspired a brewing revolution.

A sprout of an idea became a game changer

The key to both beer production and Novozymes' revolutionary new brewing solution is barley. Novozymes Ondea® empowers brewers to bring out the best in barley and produce great-tasting beers using barley as the sole raw material. This enzyme solution offers the industry a freedom and flexibility never before achieved, and the opportunity to truly slash its carbon footprint.

"This simple process will change the future of brewing."

"This simple process will change the future of brewing," says Niels Elvig, Novozymes Ondea project leader from R&D.

"Our new solution works in synergy with the

enzymes naturally occurring in barley during an infusion mashing program. What's more, it works with all standard brewhouse equipment. And the liquid solution has a robustness that makes it possible to work with a wide variety of barley types from many different geographical areas."

The unique benefits offered by Ondea successfully overcome many of the challenges currently facing the brewing industry.

"Modern brewing operations are constantly under pressure to improve productivity and increase cost savings. Corporate stakeholders are demanding that brewers become more socially responsible, and consumers are urging brewers to create new brands through their relentless search for new beverage experiences," says Patrick Patterson, Market Director of Novozymes' Beverage division. "Ondea brewing is the answer to many of

BELIEVABLE

The impressive site of Harboe Brewery, located in beautiful Skælskør in southern Zealand, Denmark.



100% BARLEY MAKES GREAT BEER

Barley is traditionally the primary raw material in beer production. To convert the barley grain into fermentable wort, enzymes are required to break down cell walls and to release amino acids and simple sugars for the yeast growth.

Novozymes Ondea® Pro makes it possible to make a standard fermentable wort from 100% barley within 2 hours mashing. Worts made from 100% barley using Ondea Pro can be used as base for creating any type of great-tasting beer. The Ondea family enables brewmasters to bring out the best in barley, and Ondea Pro is the first solution launched from this innovative group.

With Ondea Pro, the extract yield is better than typically encountered when using barley in combination with malt. And the wort and beer filtration is exceptionally efficient – and comparable to the performance expected when using well-modified malts.

“What’s very exciting is the fact that our consumer tests have proven that there is equal taste preference for beer made with barley and beer made with malt,” says Søren Højfeldt Lund, Regional Marketing Manager for Brewing at Novozymes. “We ran consumer tests in both Denmark and Germany, offering the participants two blinded beers from Harboe – one regular pilsner and one made with 100% barley. The overall results indicated that the participants liked the taste of the barley beer as much as they liked the malt beer – and they expressed an interest in buying it.”

Creatively cutting down CO₂ emissions

With today’s consumers acutely aware of the impact that industry and increased consumption have on the environment, it is evident that their products of choice should be produced to a high ethical standard. Productivity-enhancing enzyme solutions offer the brewing industry an environmentally friendly edge, and with the largest raw material contribution to the carbon footprint of beer production coming from malt, Ondea brings sustainability in brewing to a new level.

“If 18 tons of malt is substituted with barley, the greenhouse gas – or GHG – emissions are reduced by 8%, which is the equivalent to the annual GHG emissions from one passenger

car,” says Niels Kildegaard, Launch Manager at Novozymes. “Considering that breweries located in areas without well-developed malting barley agriculture often have to import malt, 100%-barley beer makes it possible for them to support local farmers by using local barley. This saves on transport costs, further reducing the brewing carbon footprint.”

Harboe has embraced the sustainability offered by Ondea Pro to create an exciting new brand to satisfy the tastes of their environmentally conscious market.

“Our latest beer, Clime8, saves the environment more than 8 g CO₂ per unit produced,” says Ruth Schade, CFO, Harboe Brewery. “Clime8 combines fresh thinking with great taste. It proves that there have been great ideas as well as exceptional beer brewing at Harboe for the past 125 years!”

Ondea brings out the best in barley to achieve great-tasting beer at less cost to the environment. With innovative breweries such as Harboe rapidly embracing the latest technology to open up their brewing possibilities and create innovative new brands, it seems the future of brewing is changing and improving before our very eyes. ■

these issues – producing a great-tasting beer while realizing maximum raw material cost savings, gaining improved productivity, creating new beverages, and reducing the carbon footprint.”

Freedom, flexibility, quality, and taste

The varying quality of malt, and the fact that it often represents the largest proportion of raw material costs, has encouraged brewers to seek effective alternatives that do not jeopardize the consumer’s experience.

“Good-quality barley is available here in Denmark,” says Martin Schade, Director at Harboe Brewery. “Ondea Pro enables us to support our own local economy while speeding up our productivity. It’s a more stable and robust process, offering us so much more flexibility with the barley that we use.”

FOR MORE INFORMATION

Søren Højfeldt Lund
shl@novozymes.com

READ MORE

www.ondeabrewing.com