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Beta-glucan as a potential value proposition for business creation

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Abstract.

Beta-glucan is a type of polysaccharide composed of a sequence of glucose (sugar) molecules linked together. It has been identified as providing great benefits for animals and humans. There are different sources of beta-glucan such as cereals (oats and barley), but those from yeast have been confirmed to be of greater benefit to both human and animal health because they allow a perfect binding with the membranes of immune cells. As a result of this high affinity, the percentage of beta-glucans that manage to bind to the immune cell receptor is notably higher than beta-glucans from plant sources. It can thus be stated that the immune response elicited by yeast beta-glucans is the highest known so far. At present, the microorganism most widely used industrially in the development of food additives is *Saccharomyces cerevisiae* because it was one of the first organisms to be genetically modified to produce such additives. However, the yeast *Yarrowia lipolytica* has also been shown to have different properties for food use. In this review, the production of beta-glucan from *Yarrowia lipolytica* for different applications will be analyzed as a great potential for business creation.

Keywords: *Yarrowia lipolytica*; Beta-glucan; Target market

Global beta-glucan market prospects

The global beta-glucan market by 2021 was worth USD 174.2 million and is expected to reach a value of USD 353.9 million by 2030. This market will mainly move in the food and beverage segments, followed by the cosmetics industry, pharmaceutical industry, animal feed and others (Grand View Research - Market Research Reports, 2022). Beta-glucan production in different countries is majorly marked in Asia Pacific as it is the leading region in the global market which accounted for a revenue share of 32.6% in 2021 followed by North America. In Africa and Middle East, this market is expected to witness a growth of 10% by 2030. Other significant growth for the beta-glucan market is anticipated to occur in Europe in the countries of Germany, UK, France, Italy and Spain as well as South America especially Brazil (Grand View Research - Market Research Reports, 2022).

Production of beta-glucan from *Yarrowia lipolytica*

In 2019 the European Union accepted the commercialization of *Yarrowia lipolytica* biomass and included it in the Union's list of authorized novel foods. It has been demonstrated that *Yarrowia lipolytica* is safe for human consumption, likewise different biotechnological applications of this yeast have been identified when used as probiotics and source for obtaining lipids. In terms of beta-glucan production, *Yarrowia lipolytica*, compared to *Saccharomyces cerevisiae*, contains three times more fat and amino acid content, including lysine, which makes it a great source of protein for animal products. In addition, the fat accumulated in *Yarrowia lipolytica* cells contains more than 90% unsaturated fatty acids and 28-44% are essential fatty acids

Target market.

- Companies that manufacture animal feed and supplements.
- Companies that manufacture food supplements for humans.
- Companies that manufacture cosmetics.

Possible competition

Icontec: Born in 2012, located in Spain-Barcelona. They stand out in the food coloring industry, they have retaken the traditional recipes for these products, but in the company of science and technology. Giving solutions to the food industry (dairy, meats, preparation with vegetables, fruits and vegetables). Within its range of products are natural colorants, nutritional coloring foods, vitamins and premixes. It also highlights the production of beta-glucan from brewer's yeast (*Saccharomyces cerevisiae*). The composition of this product for beta-glucan is 80%, protein at 7% and fat at 3%

Energy Feeling: Born in 2011, it is located in Barcelona. They are a collaborating company, where they produce, pack and deliver the product. They have more than 300 healthy references, more than 95% with

organic certification, 100% clean label, 100% gluten free (no traces of gluten), 100% of vegetable origin. Among the products they develop is beta-glucan, extracted from (*Saccharomyces cerevisiae*). The composition of this product is 79.2% beta-glucan, 2% protein and 5.2% fat.

Van Wankum Ingredients: It was born in the Netherlands in 2014. It is a supplier of ingredients for the food and pharmaceutical industry. They also offer organic ingredients and other additives. Among its products is the production of beta-glucan. It comes from (*Saccharomyces cerevisiae*). The composition of beta-glucan is 80%

Conclusions

Yarrowia lipolytica is currently being developed as a workhorse for biotechnology, however, the production of beta-glucan from this yeast is a great business opportunity as it is a new topic, where there is much to exploit. The beta-glucan from this yeast has a higher protein content compared to the products found in the market.

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