



Cruising Review

nutritional-yeast

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Nutritional-Yeast: Publications and Research from SwissMixIt



This webpage QR code

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PDF Version of the webpage (first pages)

Nutritional Yeast Botanical Information

Besides being important in the fermentation of foods and beverages, yeasts have shown numerous beneficial effects on human health. Among these, probiotic effects are the most well known health effects including prevention and treatment of intestinal diseases and immunomodulatory effects. Other beneficial functions of yeasts are improvement of bioavailability of minerals through the hydrolysis of phytate, folate biofortification and detoxification of mycotoxins due to surface binding to the yeast cell wall. This included the sufficiency of energy and protein; the adequacy of vitamin B12, iron, zinc, calcium, iodine and vitamin D; and the lack of the long-chain n-3 fatty acids EPA and DHA in most plant-based sources. However, via the strategic management of food and appropriate supplementation, it is the contention of this article that a nutritive vegan diet can be designed to achieve the dietary needs of most athletes satisfactorily. Further, it was suggested here that creatine and b-alanine supplementation might be of particular use to vegan athletes, owing to vegetarian diets promoting lower muscle creatine and lower muscle carnosine levels in consumers. yeasts, *S. cerevisiae* var. *boulardii*, brewers yeast, probiotics, phytate, folate, mycotoxins, Vegan, Vegetarian, Plant-based, Diet, *Saccharomyces cerevisiae*, apoptosis, paclitaxel, breast cancer, 4T1

Keywords: yeasts, *S. cerevisiae* var. *boulardii*, brewers yeast, probiotics, phytate, folate, mycotoxins, Vegan, Vegetarian, Plant-based, Diet, *Saccharomyces cerevisiae*, apoptosis, paclitaxel, breast cancer, 4T1

Description and Research Abstract: Besides being important in the fermentation of foods and beverages, yeasts have shown numerous beneficial effects on human health. Among these, probiotic effects are the most well known health effects including prevention and treatment of intestinal diseases and immunomodulatory effects. Other beneficial functions of yeasts are improvement of bioavailability of minerals through the hydrolysis of phytate, folate biofortification and detoxification of mycotoxins due to surface binding to the yeast cell wall.

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Balanced vegan diets meet energy requirements on a wide variety of plant foods and pay attention to some nutrients that may be critical, such as protein, fiber, omega-3 fatty acids, iron, zinc, iodine, calcium, vitamin D, and vitamin B12.

Both yeast autolysates had stimulating activity of splenocyte proliferation. Therefore, the yeast autolysates have the potential to be explored as novel natural antioxidants and immunostimulating agents for using in functional foods or medicine.

Saccharomyces cerevisiae, that have been demonstrated to exert health-promoting effects due to their rich vitamin (especially B-complex) and mineral content, as well as their role in the production of microbial proteins, beta-glucans and mannans. Hence, the intake of brewer's yeasts as a nutritional supplement is popular among vegans and health conscious people. They may be beneficial for diabetic patients and display cancer-preventive properties. The relatively unknown *Yarrowia lipolytica* deserves particular attention, since it contains highly bioavailable proteins, essential amino acids, minerals, and polyunsaturated fatty acids.

Brewer's yeast contains vitamins, minerals, amino acids and other nutrients, and has been reported to control intestinal function as well as to exert anti-ulceration, anti-tumor and anti-allergy effects.

The lipid fraction of the *Saccharomyces uvarum* yeast obtained as a by-product of industrial beer production was analyzed in order to evaluate nutritive and potential pharmacological properties of the yeast biomass. Total lipids accounted for 4.4 percent of dry biomass, 58 percent of which were neutral lipids. Mono-, di- and triacylglycerols, squalene, lanosterol, ergosterol, steryl esters and free fatty acids were identified in the neutral lipid fraction. Squalene was by far the most abundant one making up 56 percent of neutral lipids and 33 percent of total lipids, respectively.

Our earlier studies have demonstrated that phagocytosis of baker's yeast (*Saccharomyces cerevisiae*) induces apoptosis in different cancer cell lines in vitro and in vivo. This study aimed to examine how baker's yeast sensitizes murine and human breast cancer cells (BCC) to paclitaxel in vitro. Yeast alone and paclitaxel alone significantly decreased 4T1 cell viability postculture (24 and 48 hours), caused DNA damage, increased apoptosis, and suppressed cell proliferation. Baker's yeast in the presence of paclitaxel increased the sensitivity of 4T1 cells to chemotherapy and caused effects that were greater than either treatment alone. The chemosensitizing effect of yeast was also observed with murine EAC cells and human MCF-7 cells, but to a lesser extent. These data suggest that dietary baker's yeast is an effective chemosensitizer and can enhance the apoptotic capacity of paclitaxel against breast cancer cells in vitro. Baker's yeast may represent a novel adjuvant for chemotherapy treatment.

Yeast extracts, referred to as "yeast foods", can optimize these fermentation processes because they provide a multitude of essential nutrients for the fermenting yeast such as free alpha-amino nitrogen, minerals and vitamins, or generate an added benefit for a product as a result of their antioxidative properties. In industrial manufacturing processes of yeast extracts, which take advantage of autolytic, hydrolytic, plasmolytic, thermal and mechanical methods, this nutrient composition can be controlled through the choice of process parameters and the used yeast quality. As a consequence, the complex yeast extract composition made from bioactive components varies greatly in commercially available products and can thereby influence fermentation in different ways. In beer production, the high number of physiologically effective yeast extract components stimulates the yeast's fermentation performance in various ways, depending on the oxygen supply and wort composition. Besides enhanced fermentation rates, individual nutrients of the yeast extract also influence the yeast secondary metabolism and thereby the overall flavor of the beer.

Baker's yeast is currently manufactured in the United States at 13 plants owned by 6 major companies. Two main types of baker's yeast are produced, compressed (cream) yeast and dry yeast. The total U. S. production of baker's yeast in 1989 was 223,500 megagrams (Mg) (245,000 tons). Of the total production, approximately 85 percent of the yeast is compressed (cream) yeast, and the remaining 15 percent is dry yeast. Compressed yeast is sold mainly to wholesale bakeries, and dry yeast is sold mainly to consumers for home baking needs. Compressed and dry yeasts are produced in a similar manner, but dry yeasts are developed from a different yeast strain and are dried after processing. Two types of dry yeast are produced, active dry yeast (ADY) and instant dry yeast (IDY). Instant dry yeast is produced from a faster-reacting yeast strain than that used for ADY. The main difference between ADY and IDY is that ADY has to be dissolved in warm water before usage, but IDY does not.

We investigate hydrodynamic cavitation to inactivate commonly employed *Saccharomyces cerevisiae* yeast strains in an aqueous solution using different reactor and hydraulic circuit selected to demonstrate the process feasibility on the industrial scale. The target to achieve an useful lethality of the yeast at lower temperature when compared with standard thermal and even with other cavitation processes was achieved, with 90 percent yeast strains lethality at lower temperature (6.3–9.5 C), and about 20 percent lower energy input.
