



BREWERS' YEAST



BACTERIOSTATIC EFFECT OF BREWERS' YEAST

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The positive effect of brewers' yeast (*Saccharomyces cerevisiae*) on the animal organism has been considered proven in numerous practical examples for a long time now. Can brewers' yeast dispense with the need for antibiotics in feed and promote animal health by influencing the gut microbiota, thereby reducing the use of antibiotics?

The cell wall of brewers' yeast of the given species contains specific β -glucans that activate the body's own defence mechanisms against pathogens. They also contain prebiotic mannan oligosaccharides that help regulate the balance of intestinal microflora.

In addition, it is known that brewers' yeast cells contain Malucidin, a yeast antibacterial factor, which protects the yeast cells during fermentation against competitors, such as other yeasts (*Candida* / *Torula*) and certain microbes, such as salmonella. Our own studies have shown that hops ingredients found in brewers' yeast have an additional inhibitory effect against pathogens. This was first demonstrated in controlled studies using standard inhibitor tests.

Test procedure:

A recent study conducted by TeLA GmbH, Bremerhaven/Germany (Helle 2009) comparing ingredients of brewers' yeast and antibiotics was also able to verify the bacteriostatic properties.

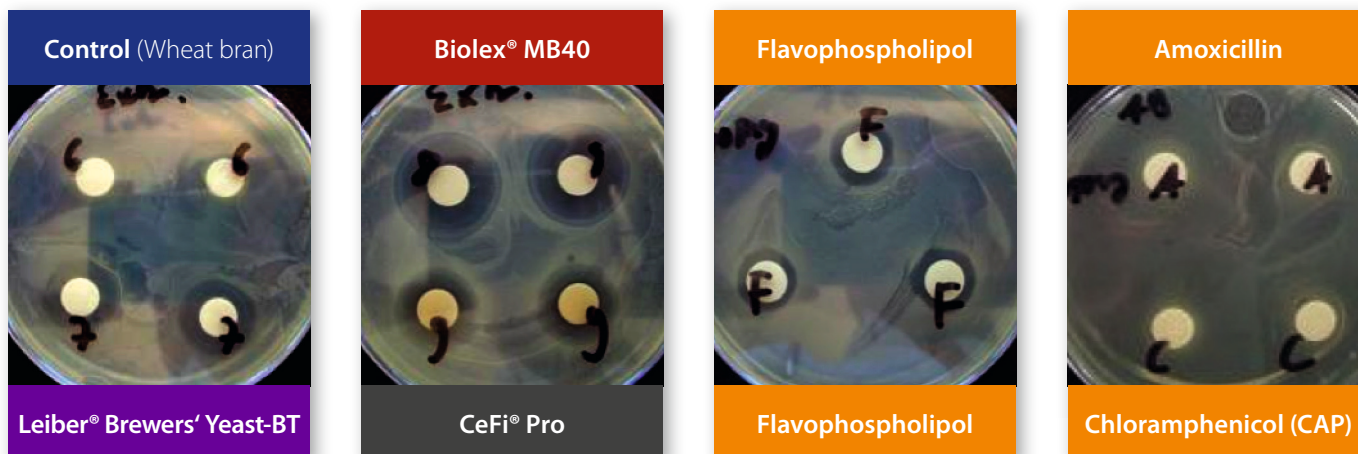
Hop constituents was determined from different brewers' yeast products using a standardised method and their inhibitory effect against the test strain of *Staphylococcus aureus* ATCC6538P was determined. Diluted solutions (1:10) of a negative control (wheat bran), three positive controls (Chloramphenicol/CAP, Amoxicillin, Flavophospholipol) and the test samples, **Leiber Brewers' Yeast-BT**, **CeFi® Pro** and **Biolex® MB40** on test disks were placed on culture medium in Petri dishes inoculated with *Staphylococcus aureus*.

Table 1 and figures 1 to 4 show partial inhibition where growth is attenuated / slowed (milky halo) and complete inhibition within a clear zone depending on the respective treatment, and expressed as the diameter of the zone of inhibition in millimetres (measured digitally).

Table 1: Inhibitory effect of different antibiotics and Leiber brewers' yeast products (zone of inhibition in mm)			
Sample	Concentration	Incomplete inhibition	Complete inhibition
Control:			
Wheat bran (-)	1:10	none	none
CAP (+)	50 mg	none	none
Amoxicillin (+)	20 mg	none	none
Amoxicillin (+)	50 mg	none	none
Flavophospholipol (+)	10 mg	--	11
Test:			
Leiber® Brewers' Yeast-BT	1:10	19	none
CeFi® Pro	1:10	21	11
Biolex® MB40	1:10	25	13

*Technische Lebensmittel- und Umweltanalytik GmbH Bremerhaven.
The Head of the institute, Dr. Norbert Helle, is an expert in the area of food analysis recognised throughout Europe.

Fig. 1 – 4: Inhibitory effect of antibiotics and Leiber brewers' yeast products on culture medium with **Staphylococcus aureus**



Results and discussion:

In contrast to other dried yeasts, brewers' yeast is unique in that it contains hop constituents. These are used to give flavour to and stabilise beer. A considerable amount of the hops remain in the fermenting yeast.

Important hop constituents include humulones (α acids) and lupulones (β acids) plus xanthohumol, as well as significant amounts of polyphenols (> 10 %). While xanthohumol is attributed with having cancer-inhibiting properties, alpha and beta acids help defend the hop plant against predation and pathogens.

The test involved often using antibiotics against Leiber brewers' yeast products. While antibiotics were dosed according recommendation, the concentration of the brewers' yeast samples corresponded to only about 10 % of the recommended dose for use in animal feed, i.e. approximately 0.2 % in compound feed.

From table 1 and figures 1 - 4, it can be concluded that **Leiber® Brewers' yeast-BT**, **CeFi® Pro** and **Biolex® MB40** (yeast cell wall) nevertheless still showed significant inhibition of *Staphylococcus aureus* growth. This compared well with the effect exhibited by Flavophospholipol. A complete suppression of the pathogen using **Leiber® Brewers' yeast-BT** is no doubt achievable by increasing the dose.

Another point worth noting is that brewers' yeast products still have an effect even where resistance to conventional antibiotics, such as chloramphenicol and amoxicillin, has apparently developed.

The natural bacteriostatic broad spectrum of Leiber's brewers' yeast is able to suppress infectious pathogens. Due to the high concentration of hop constituents on the brewers' yeast cell wall, **Biolex® MB40** seems to be particularly effective in this respect.

Conclusions

Leiber brewers' yeast products:



Effective inhibition and protection of grampositive pathogens such as *Staphylococcus aureus*.



Bacteriostatic mode of action even against antibiotic-resistant microbes.



Natural alternative to antibiotics in sensitive phases of animal production.