GALOZYME™ SWINE

Bio-regulator of the intestinal flora for swine with typified lactic yeast (Kluyveromyces B0399).

AN INNOVATIVE PRODUCT

Galozyme™ Swine is a new, effective bio-regulator of the intestinal bacterial flora for pigs and piglets. It is totally different from the usual brewer's yeasts in that its active principle is TURVAL B, an exclusive and balanced lactic yeast, a wide range of cellular metabolites, naturally occurring vitamins, and hydrolysed proteins. The benefits of active lactic yeasts in the bio-regulation and modulation of the intestinal bacterial flora in swine, and in particular piglets and suckling-pigs, have been known for some time. Unfortunately, up until now, its use has been limited due to the difficult problems involving production and conservation. Turval Labs have perfected, after years of research and experimentation, a process of biotechnological production (patented) and a balanced mixture that is able to:

a) raise considerably the probiotic properties of lactic yeasts.

b) maintain and preserve unaltered the alimentary characteristics for more than two years.

These yeasts are finally available to producers with the feed supplement Galozyme® Swine.

INTRODUCTION

THE ACTIVE INGREDIENT

Galozyme™ Swine contains the active ingredient TURVAL B that is composed of an exclusive balanced mix of typified and selected lactic yeasts (Kluyveromyces B0399), supported by a wide range of cellular metabolites, fermenting products and hydrolyzed vegetable proteins. The lactic fermenting yeasts (or lactic yeasts) belong to the Kluyveromyces genus and have been used in the food and pharmaceutical industries for quite some time now, giving very interesting results. (Chart 1)

Chart 1: List of yeast sources of industrial enzymes (Larpent, 1991):

Micro-organism enzymes

Saccharomyces cervisae invertasi

Kluyveromyces lactis Beta-glicosilasi

Saccharomyces alluvius amilasi

Saccharomyces diastaticus glicoamilasi

Kluyveromyces Fagilis (B0399)Beta-galactosidase

Candida cylindraceae lipasi

Pichia guillermondii alfa-galactosidase

Cryptococcus albidus Beta-1,4 xilanoidrolasi

Up until now, the practical use of these yeasts in the animal diet (K. Fragilis or Marxianus, in particular) was limited, due to the difficulty in stabilizing these micro-organisms (and the relative final products) using the standard industrial processes. A lengthy process of research and experimentation resulted in the refinement of a particular biotechnological method to select and typify the lactic yeast and moreover to produce the yeast on an industrial scale which stabilizes the product and raises the modulation activity of the intestinal flora. The result of this innovative and laborious procedure is the probiotic additive Galozyme™ Swine with active typified lactic yeast Kluyveromyces Marxianus/Fragilis B0399.

CHARACTERISTICS OF THE TYPIFIED LACTIC YEAST IN GALOZYME™SWINE

The principal characteristic of Galozyme™ Swine is the unique lactic yeast additive Kluyveromyces Fragilis B0399 (which sets it apart from typically used brewer's yeast in zoo-technical diets).

Its unique characteristics include: the capacity to grow (feed) and develop with extreme ease on a whey medium or other dairy by-products, the ability to enzymatically degrade lactose (due to the presence of the enzyme beta-galactosidase or lactase in the citosol) in its constituents galactose and glucose (see fig.1 and chart 2). In regards to the structural components of these active yeasts, it should be noted that the cellular wall contains a considerable quantity of polymers of mannose (glucomannani, galactomannani and peptidomannani) and of N- acetil-glucosammina organized in complex structures (chitin), as well as the endocellular presence of the natural vitamins C, E and B complex (especially B1 and B2, functional and structural characteristics of the typified lactic yeast Kluyveromyces B0399).

Fig. 1: Mechanism of action of the enzyme beta-galactosidase

GAL - O - G + H2O = GAL + G

lattosio + H2O = galattosio + glucosio

Chart 2: Glicosidase identified in the yeasts (Barnett 1981, Suomalainen and Oura 1971)

Enzyme Yeast Substratum Localization

Alfa-amilasi Candida tropicalis Amido, destrine Extracellulare

Treleasi Saccharomyces cervisae, Trealosio Citosol, m.citoplasmatica

Glicoamilasi Saccharomyces, destrine Extracellulare

Inulinasi Kluyveromyces Fragilis (B0399), Inulina Extracellulare

Maltasi Saccharomyces cervisae Maltosio, Saccarosio Citosol

Isomaltasi Saccharomyces cervisae, Isomaltosio Citosol

Invertasi Saccharomyces cervisae Saccarosio, Raffinosio M. citoplasmatica

Beta-galactosidase

(Lattasi) Kluyveromyces Fragili (B0399), Lactose Citosol

Alfa-galactosidase Saccharomyces cervisae, Raffinosio M. citoplasmatica

HIGH PRODUCTION OF LACTIC ACID

Within the ambit of the vast category of probiotic products, Galozyme™ Swine stands out for its unique characteristics, which sets it apart from common brewer's yeasts and the major part of lactic yeasts. As the in-vitro tests conducted at the University of Udine (Italy) have demonstrated, Galozyme™ Swine produces (from the fermentation of the organic substrata) lactic acid and acetic acid much more efficiently than many of the current probiotics or zootechnical diets composed of Saccharomyces cervisae (Brewer's yeast). (Chart 3)

Chart 3. Comparison of fermentation profile of Galozyme™ Swine vs. brewer's yeast (pH6,8, 39° C, 24 ore). (Univ. Udine,1999).

	Galozyme® Swine	Brewer's yeast
Lactic acid (mg/l)	2152	214
Lactic ac. + Acetic ac. (mg/l)	3483	330

ELEVATED STABILITY and ANTIBIOTIC RESISTANCE

Compared to other products with a lactobacilli basis, Galozyme™ Swine stands out for its elevated stability at room temperature (at least 24 months) and for the possibility, thanks to its particular resistance, of combining it with antibiotics such as the Ampicillin, Erythromycin, Tetracyclines and Amoxicillin (to which the major part of lactic bacteria is sensitive) and others (Total antibiotic diagram available).

HOW IT WORKS MODE OF ACTION

The action of Galozyme™ Swine is considerably different from that of the usual brewer's yeasts and lactic ferments in that its active principles:

- effectively penetrate the gastric barrier due to the large content of chitin in their cellular wall.

- perform a distinct bio-regulating and modulating action on the intestinal bacterial flora (probiotic effect) even at very low pH levels (3 - 3.5).

- play an essential role in the intestine, in the processes that interest the digestion of lactose (thanks to the activity of the specific enzyme beta-galactosidase). The biologically active presence of lactic yeast and the resulting production of lactic acid, at the intestinal level, permit new-borns and very young animals to strengthen their immune systems, thus creating favourable conditions for the implantation and development of lactic ferments.

For this reason, the administration of Galozyme™ Swine is recommended from the first days after birth in that it improves and strengthens the "general state of health" of the young subject, giving it greater "vitality" (the lower mortality rate of treated animals is evident).

- are antibiotic resistant; in particular they can be combined with tetracycline and amoxicillin to which most bacteria and or probiotics are sensitive.

- metabolise sugars, especially lactose, with the production of lactic acid which lowers the intestinal pH level to the point of slowing down the development of enteric coli-forms (direct action) and favouring that of lactic ferments and of all bacterial microflora considered "useful" (indirect action) thus performing a modulating action favouring a better microbial equilibrium.

-The probiotic action allows the animal to reach and maintain an optimum state of health, which means better plastic yields and improved rates of conversion.

BENEFITS AND APPLICATIONS

Galozyme™ Swine is a new complementary fodder, highly effective in the bio-regulation and modulation of the intestinal bacterial flora of swines, and in particular piglets (in the weaning phase and in the first and second post-weaning phases). It helps prevent and contrast pathologies due to stress, which give way to disturbances of bacterial flora in the intestinal apparatus. In piglets, it favours the development of lactic ferments and is able to increase immunity defences and therefore reduces considerably the possibility of infections, especially of the gastro-intestinal tract. In general, in piglets and sows, it favours the perfect bio-regulation of the intestinal bacterial flora. It prevents or reduces all problems due to or tied to imbalance of intestinal flora (e.g.- colic, aerophagies). It effectively stimulates digestive metabolism. It favours an easier demolition, with the production of energy, and assimilation of nutritional principles (auxinic effect). It favours disintoxication of the liver. It helps reach elevated weight increases

(auxinic effect) and improved rates of conversion. In piglets, improvement in weight gain has been seen to reach up to more than 7-8 % .

INGREDIENTS

Galozyme™ Swine comprises a balanced mixture of natural products: 80% TURVAL B (typifyed active lactic yeast Kluyveromyces F. B0399, wheat bran pre-treated and sterilized, whey powder, lactose, hydrolysed casein), 20% fine bran of wheat.

USE OF THE PRODUCT AND ADMINISTRATION

- For piglets up to 30kg: the numerous experimental trials done in Europe have shown that, if Galozyme™ Swine is administered to piglets from birth (e.g.- those in pre-weaning stage), they will rapidly reach an optimum state of health with all the benefits that go with it (evident auxinic effect).

- Weaning phase (up to 8 kg): 200g of Galozyme™ Swine per 200kg of feed.

- First phase of post-weaning (from 8 to 15 kg): 200g of Galozyme™ Swine per 200kg of feed.

- Second phase of post-weaning (from 15 to 30 kg): 150g per 200kg of feed.

The dosage can be reduced to 150g per quarter tonne of feed, if the piglets were treated since weaning or since the first phase of post-weaning.

- For fatten piglets: 50-150g of Galozyme™ Swine per quarter tonne of feed for piglets which have been previously treated.

- To obtain best results, Galozyme™ Swine should be administered continually. Larger doses may be used only during periods of stress (at birth, during weaning, during change of diet, during change of seasons, after transportation, etc).

RESISTANCE TO PELLETIZATION

It has been shown that Galozyme™ Swine, when mixed in the above mentioned proportions, even if tripled, is suitable for pelletization, as the cellular wall, rich in chitin, represents a useful protective barrier which makes the cell similar to a spore: A-cold (t°C<45°C): no mortality; B-warm (t°C<70°C): mortality less than 10 - 20%.

PACKAGING

10 kg sacks.

DURATION AND PRESERVATION

1 year, provided the product is stored in a cool (3-25°C) and dry place. The product is thermo-stabilized.

For further information, contact Techna Vet Industries Inc.

***All information written by Turval Labs SRL. For Turval Swine

*TURVAL Lab.: included in Register of high quality lab.of Ministry of Scientific Research (Italy) L. 46/82.

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***Results of analysis may vary