β-MANNANS

DON'T FEED THE PROBLEM

HEMICELL™ XT

FEED THE SOLUTION TO LOST PRODUCTIVITY FROM β-MANNANS

PRODUCT BROCHURE

Elanco

Hemicell™-XT

FEEDING THE PROBLEM

What is the problem?

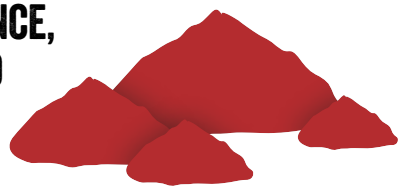
β-Mannans = polysaccharides found in vegetable feed ingredients that naturally provoke an unnecessary immune response and so **redirect energy away from growth and performance**[1-9]

> Even small amounts of β-Mannans trigger a response

Feed is the No.1 input cost for food animal production and energy is the most expensive component of feed. **β-Mannans consume of up to 3% of the total energy (ME) in feed**[10]

> Equivalent to up to 90kcal/kg ME in broilers and 63kcal/kg NE in pigs

TO MAINTAIN PERFORMANCE, ANIMALS NEED TO BE FED MORE TO COMPENSATE FOR THESE LOSSES



Even under good commercial production conditions, **β-mannans increase disease risk**:

- 1-5 % higher incidence of several conditions related to intestinal health[11]
- 3.4% higher incidence and severity of pododermatitis/ footpad lesions in broilers[11]
- β-mannans aggravate PWD incidence in pigs[12]
- Increased susceptibility to infections[13,14]
- Higher need for antibiotic treatment[14,15]

THE NEGATIVE EFFECT OF DISEASE ON PRODUCTIVITY, ALONG WITH THE COST TO MANAGE IT, QUICKLY EATS INTO PROFITS

FEEDING THE SOLUTION

Hemicell™ XT stops the expensive effects of β-Mannans

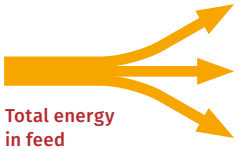
The patented energy sparing enzyme, with guaranteed final-feed potency, breaks down β-Mannans to completely prevent the immune response and waste of energy that they cause.[10,16]

HEMICELL™ XT IS APPROVED FOR USE IN BROILERS, TURKEYS AND SWINE!

A RISK-FREE WAY TO INCREASE PROFIT

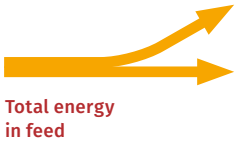
Used in-feed, with no withdrawal or restrictions when used in combination with other feed products, Hemicell™ XT simply means less wasted energy, therefore reduced feed costs and increased profit.

Without Hemicell™ XT:



- Essential body processes
- Growth/reproductive performance
- Unnecessary immune response to β-Mannans

With Hemicell™ XT:



- Essential body processes
- Growth/reproductive performance

Maintain performance on reduced feed costs

Proven Results

Reduces feed costs by freeing up to an additional 90 kcal/kg ME

- With Hemicell™, performance was maintained in broilers when dietary energy was reduced by 87 kcal/kg ME[7]
- Improves Intestinal Integrity[11]
- Improves faecal scores and broiler litter quality
- Reduces severe foot pad lesions in broilers[11]

> **The availability of Hemicell™ HT as a mainstream premix ingredient makes it possible to ensure that the performance, welfare, economic return and sustainability of all poultry flocks can be optimised.**
>
> **I have no hesitation in recommending to any poultry producer that you consider using Hemicell™ HT as a standard feed ingredient in the same way that phytase and xylanase enzymes are used as standard.**

Eilir Jones, Poultry Nutrition Limited

SPARING MORE THAN JUST THEIR ENERGY

Our support services make sure that using Hemicell™ XT is as easy as possible for you:

- Nutrition and technical consulting
- Global analysis of β-mannan levels in common feed ingredients

A FORMULATION TO SUIT EVERYONE

With both liquid and dry formulations, as well as heat tolerance to pelleting temperatures of 190º F/88º C, everyone can enjoy the benefits of Hemicell™ XT.

Elanco Hemicell™-XT™

Hemicell™ XT product specifications for use in animal feeds

Hemicell™ XT form	Application	Active enzyme(s)	Storage conditions	Stability	Recommended Inclusion per Tonne of Complete Feed*			
Hemicell™ XT (heat tolerance to pelleting temperatures of 190° F or 88° C)					Broilers	Turkeys	Weaned Pigs	Pigs for Fattening
Dry	Pelleted feed (applied in mixer)	Endo-1,4-β-D-mannanase	≤ 24° C (75° F)	24 mos. (most regions)	147 g†	147 g†	133 g†	133 g†

† Product labels vary by country. The label contains complete use information, including cautions and warnings. Always follow the regional label and advice on use.

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References: 1. Song, W., Wang, G., Chen, L. *et al.* 1995. "A Receptor Kinase-Like Protein Encoded by the Rice Disease Resistance Gene, Xa21." Science. 270: 1804-1806. **2.** Beutler, B., Jiang, Z., Georgel, P. *et al.* 2006. "Genetic Analysis of Host Resistance: Toll-Like Receptor Signaling and Immunity at Large." Annu. Rev. Immunol. 24: 353-389. **3.** Ausubel, F. 2005. "Are innate immune signaling pathways in plants and animals conserved?" Nature Immunol. 6(10): 973-979. **4.** Didierlaurent, A., Simonet, M. and Sirard, J-C. 2005. "Innate and acquired plasticity of the intestinal immune system." Cellular and Molecular Life Sciences. 62: 1285-1287. **5.** Stahl, P. and Ezekowitz, R. 1998. "The mannose receptor is a pattern recognition receptor involved in host defense." Curr. Opin. Immunol. 10(1): 50-55. **6.** Spurlock, M. 1997. "Regulation of metabolism and growth during immune challenge: an overview of cytokine function." J. Anim. Sci. 75: 1773-1783. **7.** Gabler, N. and Spurlock, M. 2008. "Integrating the immune system with the regulation of growth and efficiency." J. Anim. Sci. 86: E64-E74. **8.** Korver, D. 2006. "Overview of the Immune Dynamics of the Digestive System." J. Appl. Poultry Res. 15: 123-135. **9.** Klasing, K. 2007. "Nutrition and the immune system." Br. Poult. Sci. 48(5): 525-537. **10.** Daskiran, M., Teeter, R., Fodge, D. and Hsiao, H. 2004. "An Evaluation of Endo-β-D-mannanase Hemicell™) Effects on Broiler Performance and Energy Use in Diets Varying in β-mannan Content." Poultry Sci. 83: 662-668. **11.** Poulsen, K. Effects of Hemicell on Intestinal Health in broilers analyzed in 44 Experiences. Data on file. **12.** Vangroenweghe, F., Poulsen, K. & Thas, O. Supplementation of a β-mannanase enzyme reduces post-weaning diarrhea and antibiotic use in piglets on an alternative diet with additional soybean meal. Porc Health Manag 7, 8 (2021). https://doi.org/10.1186/s40813-021-00191-5 (REF-13331) **13.** Hsiao, H.-Y., Anderson, D.M., Jin, F.L., and Mathis, G.F. 2004. "Efficacy of β-mannanase (Hemicell®) in broiler chickens infected with necrotic enteritis. International Poultry Scientific Forum, Abstract 120, The Southern Conference on Avian Diseases. **14.** Vangroenweghe, F. & Poulsen, K. 2020. Application of Hemicell HT, a β-mannanase enzyme, restores post-weaned piglet performance in the presence of challenging protein sources. Data on file. **15.** Elanco trial number ELADE140114. 2014. Analysis of the results of Hemicell-L under commercial conditions in a German broiler integration. Data on file. **16.** Lee, J., Bailey, C. and Cartwright, A. 2003. "β-Mannanase Ameliorates Viscosity-Associated Depression of Growth in Broiler Chickens Fed Guar Germ and Hull Fractions." Poultry Sci. 82: 1925-1931. 17. Hemicell EMEA field experience

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