FEED

SUPPLEMENT
POWDER

NUTREX
CURRENT NUTRITION TECHNOLOGY EXPONENTS

BETAGALACTOMANNANASE
(MANNANASE PM)

Targeted Enzyme for Fibers/NSP in Copra Meal, Guar meal and Palm kernel Meal

MEASURABLE, QUANTIFIABLE AND VISIBLE FIBER/NSP DIGESTING ACTIVITY

BETAGALACTOMANNANASE is a targeted exogenous enzyme preparation designed to hydrolyze the major fibers/NSP in copra meal, and other ingredients with similar major fiber profile, like palm kernel meal and guar meal, releasing and making available the trapped energy and proteins.

BETAGALACTOMANNANASE improves digestibility of Copra meal, effectively digesting and removing the negative digestive effects of NSPs in the meal

BETAGALACTOMANNANASE exhibits unequalled, pronounced, quantifiable, measurable and readily visible **begalactomannanse, cellulase and *betaglucanase*** activities, digesting the major NSPs in copra meal, allowing high incorporation rates (up to 30%), and directly improving FCR and feed costs,

BETAGALACTOMANNANASE elicits visible and tangible fiber digesting activity, **with manure size and volume reduction visible the next day from supplementation.** Field tests reveal up to 60% reduction in copra meal fiber,

BETAGALACTOMANNANASE is a blend using **PURIFIED ENZYMES,** not a multienzyme

CONTENTS/gm:

betagalactomannanase 1,000 units, ***Cellulase*** 500 units

RECOMMENDED DOSE AND USE:

Premix 5 gms/kg of copra meal incorporation:

Ex. 10% copra meal incorporation = 100kg/ton x 5 gm =

500gm betagalactomannanase/ton of feed

PACKAGING

Premix 20kg pe lined box

A Performance Enhancing Nutritional Product of:

AGRIaccess
Bothell WA 98012 USA **www.agriaccess.com**

Non-Starch Polysaccharides

Description, Digestive System Impact, Presence in Wheat and other Feedstuffs

Non-Starch Polysaccharides or NSP are the main storage forms of sugars in aleurons (seeds) of some cereals and the endosperm (meats) of nuts. Although similar to starch in chemical formula, these polymers differ in the way the individual sugars are attached – "***beta***" linkages in NSP and "***alpha***" in starch. NSP are **indigestible** to monogastrics like pigs and poultry, as they lack the enzymes necessary to digest the "***beta***" type of linkages

Effect of NSP in the Digestive Tract

1. Up to 60% of the total sugars and up to 40% of total proteins of NSP containing ingredients are bound and trapped by the NSP, rendering them indigestible and unavailable to the animal
2. NSP increase the viscosity of ingesta in the gut, slowing down nutrient diffusion and hindering absorption of nutrients
3. NSP possess high water absorbing capacity, significantly increasing the ingesta volume once inside the gut, restricting feed intake .

Biochemical screening of copra meal and similar ingredients like guar and palm kernel meal reveal that the 2 major NSPs are – beta-galactomannan and cellulose .

The indicated enzymes therefore are **cellulase and betagalactomannanase.**

ANALYZED NSP CONTENT , %

Ingredient	Betagalactomannan	Cellulose
Copra meal	26.0	25.0
Palm kernel cake	21.0	39.0
Guar meal	18.0	11.0

From: USNRC 98, AGRIaccess data 2001–2008
ADF = Acid Detergent Fiber cellulose+lignin
HC = hemicellulose/soluble fiber

The enzyme **betamannanase is for betamannan**. It is **NOT FOR BETAGALACTOMANNAN in copra meal**. Betamannan is **linear,** while betagalactomannan is **branched**—entirely of different physical shapes and enzymatic templates.

BETAGALACTOMANNANASE is an exogenous enzyme preparation blended from purified enzymes, and designed to hydrolyze the main NSP *beta-galactomannan* and *cellulose* in copra meal, releasing and making available the trapped energy and proteins.

BETAGALACTOMANNANASE allows maximized use of nutrient dense, lower priced copra meal (>30%) without the negative effects previously encountered.

BETAGALACTOMANNANASE is university and farm/field tested, proven to digest up to 60% of the fibers in copra meal, palm kernel and guar

UNIVERSITY AND FIELD TRIALS REVEAL SUPPLEMENTATION OF BETAGALACTOMANNNASE ELICITS:

*Digestion of 40%-60% of NDF (Total Fiber) in copra meal **

Release of nutrients trapped in the fiber matrix:

Increased protein availability by >11%
Increased fat availability by >14%
Increased energy availability by >12%

Resulting to: Better feed efficiency by up to 13%
Higher ADG by up to 9%
Lower feed costs by up to 12%
*ROI by 1:8 or better***

**Trials on Copra meal Digestibility on Broilers , TLCP 2010*
***University Trial UPLB, C. Bautista 2009*

RECOMMENDED THRESHOLD COPRA MEAL INCORPORATION RATES WITH BETAGALACTOMANNANASE SUPPLEMENTATION

Poultry broiler - 10%
Layer - 20%
Pigs - 10% - 30%