

FEED
SUPPLEMENT
POWDER



NUTREX
CURRENT NUTRITION TECHNOLOGY EXPONENTS

MANNANASE PM premix

Targeted Enzyme for Fibers/NSP of Copra Meal

MEASURABLE, QUANTIFIABLE AND VISIBLE FIBER/NSP DIGESTING ACTIVITY

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

MANNANASE PM also exhibits significant **betaglucanase** side activity, digesting other major NSP forms in vegetable energy and protein sources

MANNANASE PM improves digestibility of palm kernel meal, effectively digesting and removing the negative digestive effects of major NSPs in copra meal - **betagalactomannan**, **cellulose** and **betaglucon**

MANNANASE PM allows maximized use of nutrient dense, lower priced copra meal (>20%) without the negative effects previously encountered.

MANNANASE PM exhibits unequalled, pronounced, quantifiable, measurable and readily visible **betagalactomannanase**, **cellulase** and **betaglucanase** activities, directly improving FCR and feed costs,



CONTENTS/kg:

Betagalactomannanase 900,000 units , *Cellulase* 1,200,000 units
and *Beta-glucanase* 40,000 units, min. activity

RECOMMENDED DOSE AND USE:

5 gms/kg of copra meal incorporation (1/2 to 1kg/ton of feed)

PACKAGING

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 common plant sourced ingredients reveal significant levels of NSP – betagalactomannans, xylans, betaglucans, celluloses, among others.

ANALYZED NSP CONTENT OF COMMON PLANT ORIGIN FEEDSTUFFS

Ingredient	ADF %	HC %	Betagalactomannan as % of HC
Pollard	11.0	25.0	
Wheat bran	13.0	29.1	
Rice bran	13.9	9.8	
Wheat, hard red	4.0	9.0	
DDGS	12.8	30.2	
Soybean meal	9.4	4.0	
Corn	2.8	6.8	
Copra meal	25.0	26.0	78%
Palm kernel cake	39.0	21.0	72%
Guar gum	11.4	12.6	88%

From: USNRC 98, AGRIaccess data 2001–2008

ADF = Acid Detergent Fiber cellulose+lignin

HC = hemicellulose/soluble fiber

COPRA MEAL

Copra meal (and similar oil seed meals like palm kernel meal, guar meal) is nutrient dense (>20%CP and up to 3200 kcal GE), and low priced considering the content. Up to 60% of the total sugar and up to 40% of the proteins are bound in NSP, mainly in the form of **beta-galactomannan and cellulose** . This high percentage of NSP has been traced to be responsible for the reduced productive performance encountered in high usage, due to **lower actual available nutrients, increased viscosity of feed, and ability to restrict intake, specially in poultry.**

USE OF *MANNANASE PM* IN DIETS CONTAINING HIGH LEVELS OF COPRA MEAL

MANNANASE PM* is an exogenous enzyme capable of hydrolyzing the **beta** bonds of the NSP **betagalactomannan and cellulose** in copra meal into the component parts – mannose and galactose, and glucose respectively – the forms now recognizable and available to body cells. The hydrolyzing action also frees and makes available the bound proteins:

1. Makes available to the animal most of the meals’ energy and proteins trapped in the NSP
2. Removes the viscosity increase, nutrient absorption reduction and intake volume restriction effects of NSP.
3. Allows maximized incorporation/usage (>20%) of lower priced but nutrient dense oil seed meals

UNIVERSITY AND COMMERCIAL TRIALS REVEAL THAT MANNANASE PM ALLOWS >20% INCORPORATION OF COPRA MEAL WITH EQUAL OR BETTER PERFORMANCE COMPARED TO STANDARD CORN-SOY, AT SIGNIFICANTLY LOWER COST OF FEED!!