

IAOM Additive Innovations

...committed to exceptional customer experiences through our products, innovation and service.

A Reminder of What You Already Know

- Weather uncertainty in the United States has helped to keep the wheat market volatile in recent weeks,
- “Kansas and Oklahoma received up to 400% of normal precipitation in the last 30 days, and both continue to face a higher probability of wetter and cooler weather ahead,” Rabobank said. “Winter wheat protein content will likely suffer, and chances of crop infection from fungi and mycotoxins have increased.”

World-Grain.com

Quoted from Rabobank

Ag. Report of May 29

An Overview

- Defining the Opportunity
 - Market Perspective
 - Mill Perspective
- Arguments Against Additive Solutions
- Requirements
- Current Examples

Market Perspective

DNS	HRW
14.0 DNS - Gulf	12.0 HRW - Gulf
\$6.88 / Bushel	\$6.37 / Bushel
75% Extraction	75% Extraction
\$15.28 Wheat Cost / Cwt Flour	\$14.14 Wheat Cost / Cwt Flour

SUMMARY	
Wheat Spread	\$1.14
Protein Spread	2.0%
Value / 1.0% Protein	\$0.57
Value / 0.1 Protein	\$.057

0.10 % protein = \$0.057 / Cwt Flour

Opportunity Cost Mill Perspective

Mill Size	Over Supply %	Cost / Day	Cost / Year
5,000 Cwt	0.10 %	\$285	\$72,900
10,000 Cwt	0.10 %	\$570	\$145,800
5,000 Cwt	0.25 %	\$713	\$182,400
10,000 Cwt	0.25 %	\$1,425	\$364,600

Assumptions:

82 % of 6-day Capacity

0.10 % pro = \$0.057 / Cwt

Opportunity From Protein

DNS 14.0 / HRW 12.0	Estimate Flour Protein	Drop in Protein	Opportunity / Cwt Flour
100% / 0%	13.0	0.0%	\$0.00
90% / 10%	12.8	0.2%	\$0.114
80% / 20%	12.6	0.4%	\$0.228
70% / 30%	12.4	0.6%	\$0.342

Opportunity “Cost” or “Margin” Potential

Protein Reduction Goal	\$ Opportunity	Additive Cost	Potential
0.20%	\$0.114 / Cwt Flour	\$.04	\$0.074 / Cwt Flour
0.60%	\$0.342 / Cwt Flour	\$0.17	\$0.172 / Cwt Flour

Arguments Against Enzymes

- Customers Only Use Numerical Specifications
- Lack of Technical Capabilities inside the Milling Company
- Never Done it Before

Requirements

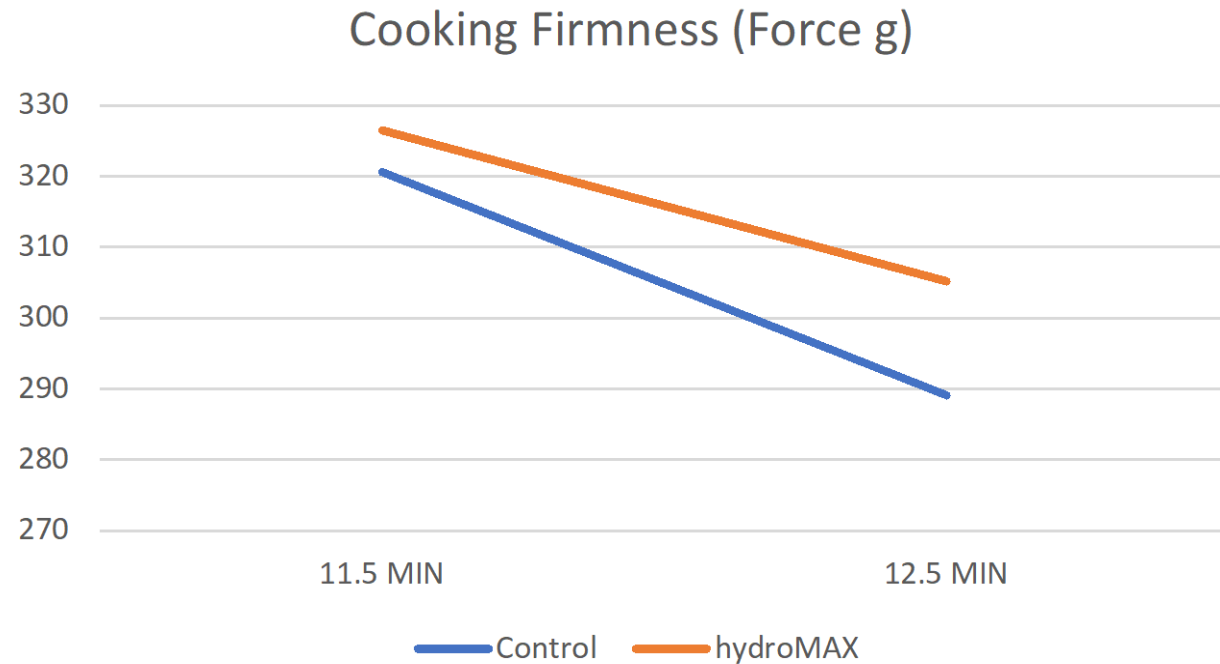
- Ability to effectively blend wheat &/or flour
- Micro-dosing System
- Defined Strategy
 - Product
 - Wheat Source
 - Additive Technology Partner
- Team Commitment from Wheat Buyer/Flour Sales/ Operations and Quality Control
- Commitment to understanding flour performance as a core competency

Bread Application Example

Sample	Wheat Blend	Wheat Cost / Cwt	Additive Cost	Flour Cost (wheat + additive)
Current Blend	80 % Local / 20 % Imported CWRS	\$14.25	\$0.20 / Cwt	\$14.45
"Improved Blend"	70 % Local / 30 % Imported CWRS	\$14.75	\$0.30 / Cwt	\$15.05
Engrain Solution	100 % Local	\$13.30	\$0.55 / Cwt	\$13.85
		2,000 Cwt/day	\$0.60 / Cwt	\$1200 / day



Pasta Improvement Example



hydroMAX 850R – commercial solution currently sold in the Latin America, Africa and Southeast Asia markets; contains enzymes with riboflavin supplied at 50 ppm for color



Other Application Examples

- Pizza Flour – increase extensibility
- Tortilla Flour – increase extensibility or softness
- Bread – Volume, Crust / Crumb improvement, Fermentation tolerance
- Water Holding Capacity
- Protein – weaken / mellow or strengthen
- ??? – ask your customer

Our Organization

- Headquartered in Salina, Kansas, USA
- Engrain launched in 2008 to help millers take advantage of market opportunities through enzyme application
- Merging of expertise in milling and global wheat marketing with applied enzyme/ingredient technologies
- Complete network of global sales and service with locations in Colombia, Guatemala, Kenya, Malaysia, Viet Nam, South Africa & U.S.

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