



## Dairy Info Day



Presentation : January 11<sup>th</sup>, 2013

Janna Moats  
Dr. David Christensen

## Company History

1960's thru 1980's



2011 to present



1990s to 2000's





## Functional Foods & Omega-3 Fatty Acids



### What is a Functional Food

- A conventional food product that demonstrated physiological benefits beyond its basic nutritional value

*Agriculture and Agri-food Canada*

GOOD THINGS COME IN  
OMEGA-3s

## Omega-3s & Fatty Acids

- Essential fatty acid
  - Required for normal physiological functions
  - Cannot be synthesized in body and therefore must come from the diet.
- Omega-3s are found in three main forms:
  - ALA
  - EPA
  - DHA

GOOD THINGS COME IN  
OMEGA-3s

## Omega-3 Benefits

### Human

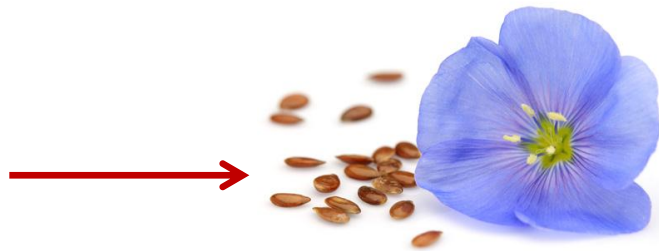
- Prevention of heart disease
- Reduced risk of stroke
- Suppressed inflammation
- Lowered cholesterol levels
- Weight control

### Animal

- Increased conception rates
- Improved embryo survival
- Improved Animal health

## Human Dietary Omega-3 Sources

- Fish and fish oils
- Nut oils
- Algae
- Flax



## A Naturally Better Solution Flaxseed

- Flax has high levels of ALA
- Flaxseed is a difficult seed to digest due to its high oil content and the extremely hard protective husk
- Solution?
  - LinPRO®

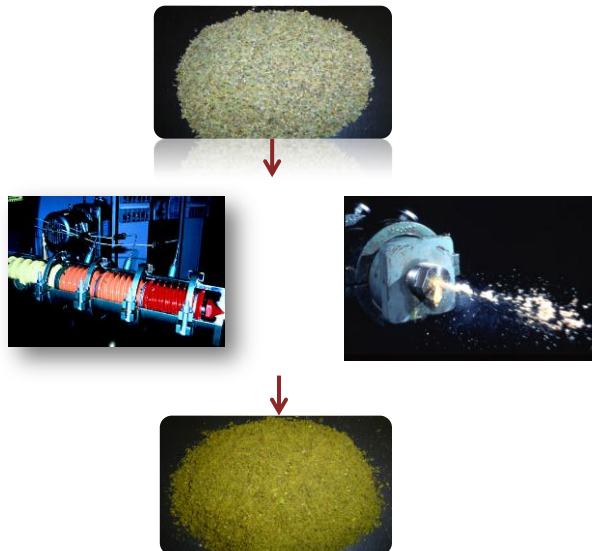
---

## Why LinPRO® ?



---

## The Natural Solution



## Functional Food Advantages of LinPRO®

- Biological animal performance - consistency
- Achievable Omega-3 content in Meats, Eggs & Dairy
- Superior sensory evaluation – no after-taste
- Repeatable performance



**LinPRO® from O&T Farms**

*A Naturally Better Source for  
Omega-3 Meat, Eggs and Dairy.*

---

## Research



---

### Cattle Research Direction

- Increase omega-3 fatty acid content of milk and meat.
    - This will be mainly alpha-linolenic acid (ALA) from flax. Some EPA, DPA and DHA will also be produced. CLA will also be increased.
  - Typical dairy and beef rations produce about 0.5% of fatty acids in milk and meat fats. LinPro-RS increases this to about 1.25% of fat.
  - Newer formulations and higher feeding levels are being tested.
-

## Flax: Immunity and Reproduction

A number of research projects at other research centers have shown improved immune status and embryo survival when at least one kg of flax is fed to cows daily.

This effect may be related to lignans (steroid like antioxidants), unique peptides as well as ALA (omega-3).

## Composition of LinPro-R

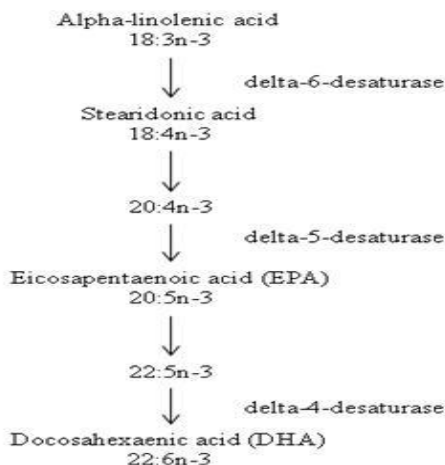
Ingredients are flax (55%), pea grain, alfalfa and components to minimize rumen hydrogenation of ALA.

---

Crude Protein, %	20
Crude Fat, %	20
ALA as % of fat, %	52
NDF, %	23
TDN, %	104



## Alpha-Linolenic Acid conversion to other Omega-3 Fatty Acids: (Liver, brain, other tissues).



## Current Flax Projects

- The LinPro-R products contain 55% flax, alfalfa, peas and a number of ingredients that in combination with extrusion increase transfer of ALA to milk and meat fat.
- Linpro-R increased ALA to about 0.9% of fatty acids.
- LinPro-RS increased the level to 1.25%.
- Currently LinPro-RA is being tested with the objective of reaching at least 1.6% of fatty acids.
- Food Centre production of Omega-3 fatty acids from high omega-3 milk.

### Estimation of Required Milk Omega-3 Levels for Various Products

			Whipping	2%	7 % fat	Ground
	Cheese	Butter	Cream	Milk	Drink	Meat
Product fat %	34	80	34	2	7	28
Fatty acid, % of fat	90.0	90.0	90.0	90.0	90.0	90.0
Fatty acid, % of product	30.6	72	30.6	1.8	6.3	25.2
Serving size, g	60	30	60	250	250	100
Serving, mg of Omega-3	300	300	300	300	300	300
Required Omega-3,% of FA In Original Milk	1.63	1.39	1.63	6.67	1.90	1.19

### Fatty Acid Composition of Beef Steers fed **LinPro-35**

	Palmitic acid		Stearic acid		Alpha-Linolenic		EPA		DHA	
	C16:0		C 18:0		C 18:n3		C20:5 n3		C22:6 n3	
	Control	LinPro	Control	LinPro	Control	LinPro	Control	LinPro	Control	LinPro
Hamburger	26.4	25.6	14.0	13.6	0.36	0.72	0.02	0.03	0	0
Loin	24	24.6	12.5	12.4	0.34	0.90	0.16	0.23	0	0
Rib eye	25.4	25.3	12.2	12.8	0.25	0.78	0.18	0.14	0	0
Liver	13.1	11.0	25.7	25.5	0.71	2.28	0.71	1.61	1.74	2.0
Heart	13.8	12.2	15.8	15.7	0.56	2.05	0.83	0.96	0.41	0.10

<b>LinPro-RS Effect on Milk Fatty Acids</b>		
<b>Name</b>	<b>Control</b>	<b>LinPro-RS</b>
<b>C4:0 Butyric</b>	<b>1.11</b>	<b>0.72</b>
<b>C14:0 Myristic</b>	<b>12.7</b>	<b>11.8</b>
<b>C16:0 Palmitic</b>	<b>33.9</b>	<b>28.8</b>
<b>C18:0 Stearic</b>	<b>11.1</b>	<b>13.7</b>
<b>C18:1 Oleic</b>	<b>21.7</b>	<b>26.5</b>
<b>C18:3n3 ALA</b>	<b>0.53</b>	<b>1.0</b>
<b>C18:2 n6 CLA</b>	<b>0.33</b>	<b>0.47</b>
<b>C20:5n3 EPA</b>	<b>0.04</b>	<b>0.07</b>
<b>C22:5n3 DPA</b>	<b>0.06</b>	<b>0.06</b>
<b>Omega-3 ,% of FA</b>	<b>0.73</b>	<b>1.26</b>
<b>Milk fat, %</b>	<b>4.02</b>	<b>4.24</b>
<b>FA as % of milk fat</b>	<b>87.2</b>	<b>90.5</b>

## Summary and Conclusions

- Consumers value food differently today
- LinPRO® maximizes the omega-3 benefits for both livestock and humans
- Opportunity for omega-3 functional food development in Saskatchewan?



# Thank You

**LinPRO® from O&T Farms**

*A Naturally Better Source for  
Omega-3 Meat, Eggs and Dairy.*

