



linPRO[®]-R
Ruminant

A Rumen Protected OMEGA-3 Feed Ingredient

What is it:

linPRO-R is a free-flowing Omega-3 feed ingredient developed specifically for the rumen environment to provide Omega-3 fatty acids in a ruminant safe manner, optimizing livestock performance, health and food enrichment.

Core Benefits:

- ✓ Shelf ready and safe
(no-grinding of hard-shelled flaxseed)
- ✓ Stable, greater than 14 months shelf life.
The matrix that is formed through our manufacturing process protects the highly unstable polyunsaturated fatty acids (PUFA)
- ✓ Rumen safe. The manufacturing process mitigates ruminal biohydrogenation of the Omega-3 PUFA
- ✓ 50% to 65% bypass Fat%

How is it made:

linPRO-R is a combination of land-based sustainable ingredients (field peas, flaxseed and alfalfa) manufactured through an advanced patented technology. Using high pressure processing: friction and heat cause the eruption of the hard-shelled flaxseed, and a simultaneous gelatinization of the field peas to create a new protein/starch/fat matrix. The result is a rumen safe, nutrient rich product called **linPRO-R**.

Opportunities:

- ✓ Improved health
- ✓ Omega-3 enriched dairy products
- ✓ Ability to change the sensory effect on cheese and butter (softer)
- ✓ Optimize productivity performance
 - Increased milk yield with maintained milk components
 - Improved feed efficiency
 - Improved reproductive performance



O&T Farms
Naturally Better



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1. Enhancing the Value of the Milk and Dairy Products

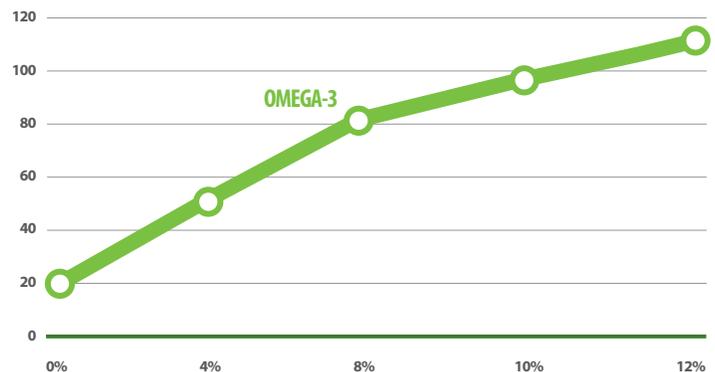
- ✓ Linear improvement of Omega-3's into raw milk, leading to nutritionally better products. It all starts with the cow's diet
- ✓ Typically, 3.25% glass of whole milk has 20mg Omega-3 per serving
- ✓ A glass of 3.25% milk can be enriched with over 80mg of Omega-3 per serving
- ✓ By incorporating **linPRO-R** into the cow's dietary rations, dairy products can be enriched with more than 3X the Omega-3 per serving
- ✓ Improving the Omega-6: Omega-3 ratio to less than 2:1



Mother, children and aging markets can benefit from this enrichment



Increased Omega-3's per Milk Serving



% of **linPRO-R** to DMI per Cow

—○— mg's Omega-3 per Serving of 3.25% Milk



2. Targeted Omega-3 Fat Feeding:

It's All About Balancing the Omega-6: Omega 3 Ratio

- Omega-6's are over-abundant in dairy rations and amplify inflammation (corn, soybean, canola)
- Omega-3's provide the counterbalance, providing the anti-inflammatory balance (flaxseed)
- Feeding strategies include working through the transition period (dry, early lactation) when the cow is in a negative energy position, with an excessive bacterial environment

Results:

- Reduction of somatic cell count (SCC)
- Reduction in mastitis
- Less involuntary cull's
- Suppression of the Progesterone Hormone $PGF_{2\alpha}$ during conception period

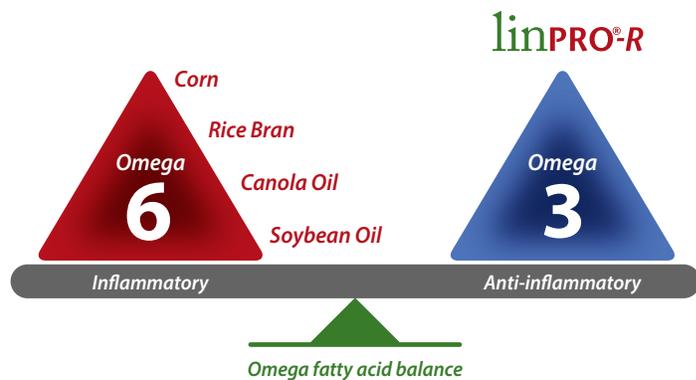
Recommendations:

- ✓ A targeted Omega-3 inclusion using **linPRO-R** at approximately 3% DMI
- Freshening
- Up to first insemination (65 days post calving)
- Full term

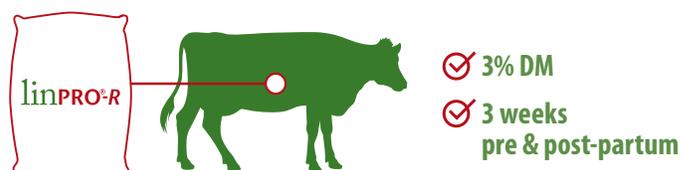
Supporting Research:

I. Penn State (2017, 2019)

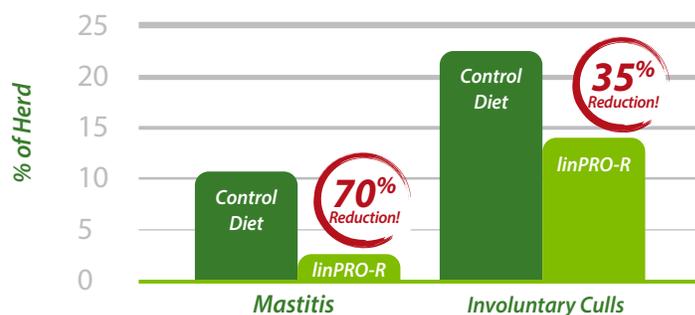
- Penn State research studies investigated the impact of targeted Omega-3 feeding using **linPRO-R** on the immune function, plasma metabolites and fatty acid (FA) composition of milk in primiparous dairy cows
- Extension research was done two years later, for 18 months on a large Pennsylvania Dairy supported the University findings



Targeted Fat Feeding Adding Balance



Health Events in dairy cattle (UC Davis data)



II. UC Davis, CA (2019, 2020)

- Extension research done with UC Davis associates on two large Tulare, CA dairies

Milk Production and Composition (UC Davis Data)

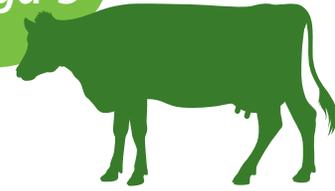
linPRO-R Inclusion into DMR	Milk Yield (lbs/day)	Milk Fat Yield (lbs/day)	Milk Protein Yield (lbs/day)	Milk Lactose Yield (lbs/day)	Somatic Cell Count (x 1000)
Control (0% linPRO-R)	105	3.6	3.0	5.1	132
2.5% linPRO-R (1.5#)	110	3.7	3.1	5.4	81
5.0% linPRO-R (3.0#)	112	3.8	3.2	5.4	100



3. Improving Reproduction

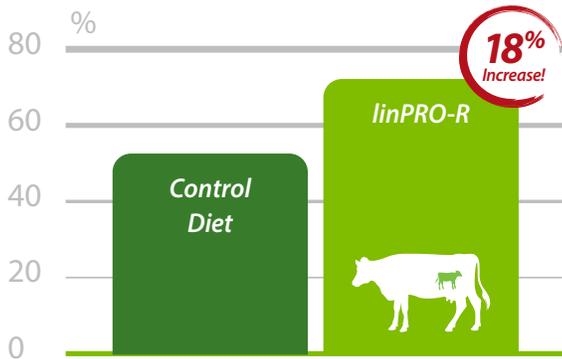
✓ **linPRO-R** supports reproductive success

- Improved pregnancy rates
- Increased energy density of the diet supports the transition period

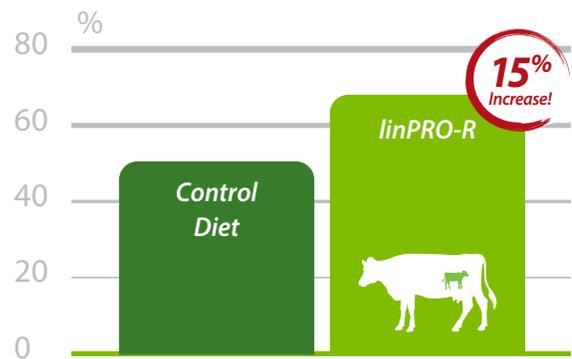


✓ Results

First Service First service conception rates for primiparous cows fed **linPRO-R** for 3 weeks pre-partum



Overall Overall conception rates for primiparous cows fed **linPRO-R** for 3 weeks pre-partum

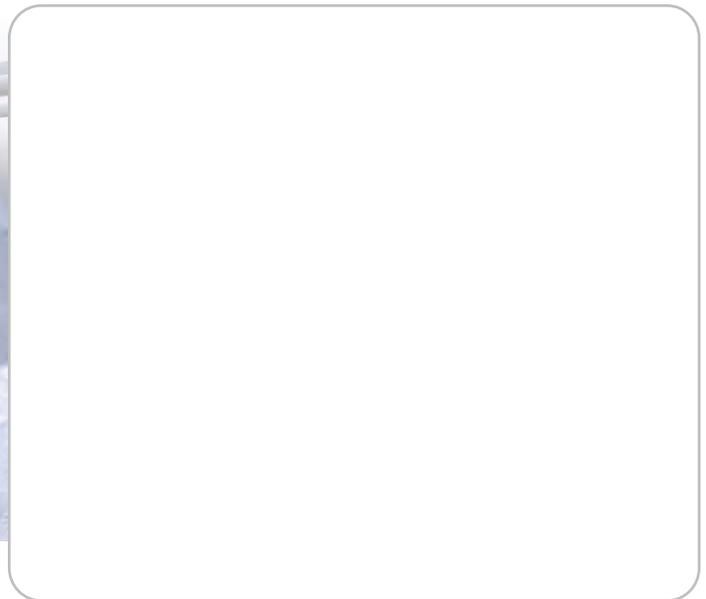


IMPROVE REPRODUCTION PERFORMANCE

Feeding **linPRO-R** 3 weeks pre-partum improves overall reproductive performance in first lactation cows



Commercial production is presently being done.



Place of Origin



Manufacturer

