NeoTec4®

A Specific Blend of Fatty Acids

Butyric acid

- Stimulates maturation of pancreas
- Stimulates maturation of intestinal and ruminal epithelium (absoptive area)

Medium chain fatty acids

- Antibacterial, anti-viral
- Catalyst for utilization of other active fatty acids

Linolenic acids

- Involved in immunity
- Anti-inflamatory
- Stimulates growth of bone

References:

Am. J. Clin. Nutr. 69:890–897 (1999), FASEB J. 14:2380–2382 (2000), J. Nutr. 132:1395S-1577S (2002), Merchant et al. (2005), J. Dairy Sci. 92:1038–1049 (2009 Am. J. Clin. Nutr. 85:385–391 (2007),), J. Dairy Sci. 93:5842–5850 (2010), J. Dairy Sci. 94:3936-3948 (2011).

NeoTec4® Research

The Nurture Research Center conducts the research and reports it in journal articles reviewed by university experts for all phases of calf nutrition and management.

Nurture Research Center

COLOSTRUM REPLACERS / MILK SUPPLEMENTS
MILK REPLACERS / STARTERS / GROWERS

Then Apply Science.

Research-based products with published ***Real Science*** behind them.

NeoTec4® ...for calf performance and profit

Research published in expert reviewed journals demonstrate the value of the specific fatty acids in NeoTec4®.

Value of specific fatty acids in milk replacer trials published in full journal articles [8-14]

Trial	Scours Reduction	ADG Improvement	Frame Growth Improvement	Feed Efficiency Improvement
1	12%	4%	Not Measured	3%
2	43%	25%	7%	17%
3	26%	7%	19%	2%
4	23%	7%	30%	6%
5	13%	20%	5%	13%
Average	**23%**	**12%**	**15%**	**8%**

Value of specific fatty acids in starter and grower trials published in full journal articles [8-14]

Trial	ADG Improvement	Frame Growth Improvement	Frame Efficiency Improvement
Average of Starter Research	**9%**	**20%**	**10%**
Average of Grower Research	**6%**	**13%**	**9%**

(800) 392-8324 • (800) 553-1712
www.neotec4.com

rev. 03/12

NeoTec4®

...for calf performance and profit

Reduce Scours

Improve ADG

Improve Frame Growth

Improve Feed Efficiency

NeoTec4®

Should be included in:

- COLOSTRUM REPLACERS
- MILK SUPPLEMENTS
- MILK REPLACERS
- STARTERS & GROWERS

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NeoTec4®

Specific Fatty Acids for Optimal Calf Performance

The specific fatty acids in NeoTec4® (butyric acid, medium chain fatty acids, and linolenic acid) are deficient in the typical US calf's diet.

For example, milk replacers are based on lard and tallow from pigs and cattle. Pigs and cattle are fed diets based on corn and soybeans which are low in linolenic acid. Thus, the fat in pigs and cattle are low in linolenic acid and butyric acid and medium chain fatty acids are not stored in animal fat.

Calf starters and growers are based on corn, oats, wheat, and soybeans, which are low in butyric acid, medium chain fatty acids, and linolenic acid. Table 1 shows a typical fatty acid profile of a calf's diet.

Table 1. Typical diet

Fatty Acid		% in Diet
C4, butyrate		0.01
C10	Medium chain fatty acids	0.01
C12		0.02
C14		0.01
C18:2, linoleic		2.33
C18:3, linolenic		0.16
Ratio Linoleic : linolenic		14.6

Fatty acids are nutrients. Some are have functional roles in the immunity, production of hormones, growth of bones. Others are essential for bodily functions. If deficient in the diet, we can observe less than optimal calf performance.

Immunity & Health

Calves are prone to scouring and respiratory sickness. They are also dependent upon consumption of high quality and clean maternal colostrum to establish their initial immunity.

There is an abundance of human and animal research reporting the benefits of specific fatty acids to immunity and health. Below we have summarized all 5 of the trials evaluating markers of immunity in relation to feeding diets without and with NeoTec4®.

Markers of Immunity

	Trial				
	1	2	3	4	5
Blood Fraction					
Tumor necrosis factor alpha	v	v	nd	nd	nd
Interlukin-4	^	^	nd	nd	nd
Globulin protein	^	^	nd	^	nd
Urea nitrogen	v	v	nd	v	v
Albumin	^	^	nd	^	^
Titer					
Bovine viral diarrhea type 1	^	^	^	^	^
Parainfluenza-3	^	^	^	^	^
Calf Health Measurements	^	^	nd	^	^

*Symbols indicate a decrease (v) or increase (^) in calves fed NeoTec4® vs. the control. nd means that this item was not determined in the trial.

Description of Immune Markers:

Tumor necrosis factor alpha is increased in the blood soon after a pathogen challenge and is involved in causing the fever response and turning on other parts of the immune reaction. Interleukin-4 is often associated with signaling various globulin proteins to attack the pathogen. Several globulin proteins are involved in attacking the pathogen. Fever and pathogens cause a breakdown in body proteins to urea nitrogen during a pathogen attack. If protein or nitrogen intake between treatments are equal (as in the trials reported here) a lower concentration of urea nitrogen in the blood or serum is positive and indicates less loss of nitrogen and damage from the pathogen and more efficient use of nitrogen in the calf. Albumin is a major blood protein that often declines from normal levels during periods of sickness, so higher concentrations in the blood indicate less challenge from the pathogens. Titers to vaccines typically increase and after the second booster vaccine increase and have a pattern of concentration in the serum over time much like a normal lactation curve of a dairy cow. So higher titers indicate longer term protection from that disease. Young calves like in this trial are born with near zero titers but gain titers from the adequate consumption of high quality colostrum. However, some calves do not have good titers due to limited consumption colostrum or consumption of poor quality colostrums. Thus, a baseline titer for individual calves was established from serum samples taken on day 0 of the trials and post-booster vaccine titers correlated to the baseline titer. Likewise, blood samples immediately before and after the *Pasteurella* vaccine or *Salmonella* toxiod were correlated to see the response of the specific blood fraction.

NeoTec4®

References on NeoTec4® and its development:

1. Effects of changing the fat and fatty acid composition of milk replacers fed to neonatal calves
   Prof. Anim. Sci. 23:135-143 (2007)

2. Amino acid fatty acid and fat sources for calf milk replacers
   Prof. Anim. Sci. 23:401-408 (2007)

3. Effects of changing the fatty acid composition of calf starters
   Prof. Anim. Sci. 23:665-671 (2007)

4. Effects of changing the essential and functional fatty acid intake of dairy calves
   J. Dairy Sci. 92:670-676 (2009)

5. Selenium yeast for dairy calf feeds
   Animal Feed Science and Technology
   153:228-235 (2009)

6. Effect of yeast culture, fatty acids, whey, and a peptide source on dairy calf performance
   Prof. Anim. Sci. 25:794-800 (2009)

7. Impact of various fatty acids on dairy calf performance
   Prof. Anim. Sci. 27:167-175 (2011)

8. Fatty acid intake alters growth and immunity of milk-fed calves
   J. Dairy Sci. 94:3936-3948 (2011)