

A natural performance enhancer, for the start of a lifetime!

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Young calves face a lot of challenges during their lifetime. The main focus points for farmers in terms of calf rearing are health, rumen development and growth.

To help calves in their critical early stage of life, Provimi has developed a unique natural package, named NuStart. This package is designed to optimise growth, development and health in the early stages of a ruminant's life. The NuStart formula is included in all Joosten Products' calf milk replacers.

NuStart is a unique combination of essen-

Source	Active compound(s)	Properties
Cinnamon	Cinnamaldehyde	Appetite and digestion stimulant, antiseptic
Rosemary	Cineole	
Oregano	Carvacrol	Appetite stimulant, antiseptic
Coriander	Linalol	Digestion stimulant
Thyme	Thymol	Appetite stimulant, antiseptic, antioxidant
Aniseed	Anethole	
Garlic	Allicin	Digestion stimulant, antiseptic

Table 1. Common plant extracts and their properties.

tial oils, probiotics, natural antioxidants and a prebiotic. It includes a precise profile of vitamins and trace elements for young calf development.

Essential in this is that the different addi-

tives have to have an optimal and synergetic effect. In the NuStart formula, Provimi has selected and evaluated the additives that they believe are really beneficial to the animals.

Essential oils

Etheric oils or essential oils are oils which contain the oil of the plant from which they were extracted. Plants and their extracts have formed part of diets as preservatives, flavours, digestive enhancers and remedies for millennia. Each plant extract (etheric oil) has its own performance benefits (Table 1).

Provimi has selected a unique blend of etheric oils derived from different herbs and spices. These selected etheric oils have proven to have beneficial effects on health and growth. Table 2 shows the results of daily gain of different trials with rearing calves.

Antioxidants

Vitamin E has been supplemented to calf milk replacers for many years. For a long time vitamin E has been recognised as a natural biological antioxidant.

Free oxygen radicals arise naturally in the metabolism of different nutrients. Antagonists of these free radicals are antioxidants. The right balance between these two prevents cell damage. If free radicals outnumber the anti-oxidants, an oxidative stress is occurring.

Causes of oxidative stress in husbandry animals are oxidation of (poly-)unsaturated fatty acids in feed, poisoning by, for exam-

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	Number of calves	Control	Control + essential oils	Difference (%)
Trial 1	48	404	454	+12
Trial 2	48	444	505	+14
Trial 3	50	330	429	+30

All three trials were done by Provimi/Akey (USA). For every trial, different types of CMR were used.

Table 2. Daily gain (g) over 42-day milk fed period.

Supplemental vitamin E (IU/d per calf)	0	125	250	500
Overall weight gains (kg)	125 ^a	144 ^b	143 ^b	131
Concentrate consumption (kg)	370	387	367	324

^{a,b}Means with different superscripts differ ($P < 0.05$). Source: P.G. Reddy, J.L. Morill, and R.A. Frey, *Journal Dairy Science* 70: 123-129.

Table 3. The effect of supplemental vitamin E on the performance of calves.

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ple, heavy metals and unbalanced nutrition and suboptimal management/climate. Vitamin E plays an important role in the functioning of the immune system.

Supplementation of vitamin E gives the calf more resistance to stress-related problems like, for example, dehorning, vaccinations and diseases.

Table 3 shows the effect of supplemental vitamin E on the performance of calves. Some 32 Holstein heifer calves were used from birth to 24 weeks of age. Calves in each group were randomly allotted to one of four treatments: 0 (control), 125, 250, or 500 of supplemental vitamin E/calf per day. Overall weight gains at 24 weeks were higher with 125 and 250 IU and intermediate with 500 IU supplementation compared with no supplementation.

Recently, several studies indicate that over supplementation of vitamin E has no beneficial effect or may actually increase for example the risk of heart failure. There are simply no additional benefits of vitamin supplementation beyond metabolic requirements.

In recent years Provimi has searched for some alternatives for vitamin E. GrapePP was found to be an excellent replacer of vitamin E. GrapePP has a broad spectrum of antioxidant activity. Besides this GrapePP has a very high bio-availability and excellent thermo-stability.

In research a synergistic effect between GrapePP and vitamin E activity has been

observed. Another advantage when using a combination of vitamin E and GrapePP is avoidance of vitamin E overdosing.

In repeated trials carried out at Provimi's research farm, De Viersprong in the Netherlands, growth rates in calves fed calf milk replacer containing NuStart consistently out-performed the control groups.

A group of 24 Holstein calves were split into two even groups and fed a 20% CP, 18% fat milk replacer for six weeks and a 19% CP muesli starter fed ad libitum from two weeks of age.

The group where NuStart was included in the milk replacer achieved a daily liveweight gain of 26% more than the control group and a 17% increase in starter intake. This led to significant improvement in feed efficiency. NuStart will improve the digestion process and increase feed intake, which boosts growth rates and improves feed conversion and general and intestinal health. (Fig. 1).

The benefits of NuStart include:

- Minimises disease challenge.
- Improves intestinal health.
- Enhances digestion.
- Increases starter intake.
- Improves daily gain and feed conversion ratios.

This results in:

- Healthy and content animals.
- More rumen development.
- Optimum growth rate.
- Reduced production costs.
- More profit.

Fig. 1. The effect of NuStar on starter intake and growth rate.

