



Ultra-Gut

calcium- and sodium butyrate



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Our Ultra-Gut product line consists out of different types of calcium- and/or sodium butyrate. These products significantly boost animal health in general and gut health more specifically. A better developed animal gut optimizes nutrient uptake and enhances pathogen protection, resulting into improved animal performance, lower mortality and reduced use of antibiotics.



matrix coating technology

Proviron's Ultra-Gut product line consists out of different butyrate powders and matrix coated calcium- and/or sodium butyrate's. Our film coated butyrate powders are perfect for the use in milk replacers. Furthermore, we have special matrix coated butyrates, which are designed for the usage in the solid feed of young ruminants. To ensure a gradual release in the rumen and small intestine, we use our special matrix coating technique. Just as important, correct coating reduces the typical unpleasant smell of butyrate.

www.proviron.com/animalhealth

Ultra-Gut



boosting animal gut health & reducing antibiotic use



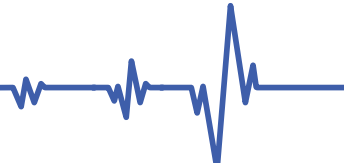
At Proviron we believe in creating a better world with sustainable farming, healthy animals with better performance and less antibiotic use. By developing and producing innovative products we want to contribute to this belief. Proviron's animal health solutions are based on salts of butyric acid, but also on high purity monoglycerides and triglycerides.

science based working mechanism

The beneficial role of butyrate in animal nutrition is widely recognized. Calcium- and sodium butyrate is well known for enhancing animal health and performance. Different studies showed the following effects when using calcium- or sodium butyrate as a feed supplement:

- ✓ Stimulates villi growth and thereby the digestive surface
- ✓ Improves the gut barrier function
- ✓ Balances the gut microbiota
- ✓ Increases insulin sensitivity in muscle tissue
- ✓ Stimulates the animal's immune system
- ✓ Improves the antimicrobial activity
- ✓ Increases nutrient digestion and absorption

This in turn, will result in increased animal health and performance.



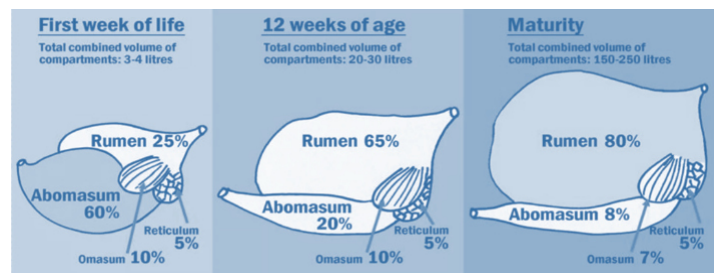
Calf specific products

Calves are born with their abomasum as the only functional part of the four-stomach system, but the rumen is undeveloped in this early life stage. The rumen needs to change both structurally and functionally as the calf grows older. For more economic advantage, early rumen development is very important. This can be achieved by adding butyrate to the milk replacer and first solid feeds.

difficulties in early life

In the first weeks of life milk remains the primary source of nutrients for calves, in this life stage solid feed intake is reduced or even absent. Milk bypasses the rumen in this stage via the 'esophageal groove' and has little to no effect on rumen development (see Figure 1).

Butyrate can be added to the milk replacer (and starter feed) to stimulate rumen and gut development when the calf is maturing (this even without the solid feed intake). When there is a lack of rumen development before weaning, there will be a decline in growth after weaning. To prevent this, Ultra-Gut can be added to the MR and first solid feeds.



natural occurrence and the importance of butyrate in MR and first solid feeds

Colostrum has the greatest butyrate concentration (approximately 2.1% of dry matter), followed by milk (approximately 1.2% of dry matter), whereas milk replacer has the smallest amount of butyrate quantity (depending upon the source and amount of fat in MR).

The addition of butyrate to milk replacers and starter feeds can compensate for the butyrate deficiency and has shown positive effects on rumen and intestinal development. When fed butyrate from the first week of life (via MR or solid feed), butyrate increased the rumen papillae length, the intestinal development, the pancreatic secretions and the nutrient digestibility. This in turn will result in an improved average daily gain and improved general health in calves. To ensure gradual release of butyrate in the solid feed, the use of a matrix coated version of Ultra-Gut is advised.

Unprotected butyrate addition into the MR increases body weight in calves, whereas protected butyrate addition in the starter diet increases diet intake. Consequently, butyrate supplementation in both MR (unprotected form) and starter feed (protected form) for newborn calves can be recommended.

proven results of calcium and sodium butyrate in calves



Different studies showed the following benefits of using calcium- or sodium butyrate in calves:

- Enhanced feed intake
- Improved growth performance
 - Increased average daily gain
 - Higher body weight
 - Improved FCR
- Stimulated rumen development, indicated by:
 - Increased stomach weight
 - Increased rumen papillae development (length and width)
- Stimulated intestinal development
 - Increased villi height in the small intestine

product range



coated butyrates

Commercial name	Acid	Ultra-Gut	Technical name	Physical property at 20°C	Melting point (°C) (2)	Packaging (bag, bigbag)
Ultra-Gut C	C4	Pure Ca salt of butyric acid	Calcium butyrate	Powder	>300°C	50x20kg, 1x500kg
Ultra-Gut C90		Film coated Ca salt of butyric acid	Calcium butyrate 90%	Powder	>300°C	50x20kg, 1x500kg
Ultra-Gut S40*		Matrix coated Na salt of butyric acid	Sodium butyrate 40%	Micropellet	54°C	50x20kg, 40x25kg, 1x500 kg
Ultra-Gut Duo50*		Matrix coated Na and Ca salt of butyric acid	Sodium- and calcium butyrate 50%	Micropellet	54°C	50x20kg, 40x25kg, 1x500 kg
Ultra-Gut Duo70		Matrix coated Na and Ca salt of butyric acid	Sodium- and calcium butyrate 70%	Micropellet	54°C	50x20kg, 40x25kg, 1x500 kg
Ultra-Gut C80		Matrix coated Ca salt of butyric acid	Calcium butyrate 80%	Micropellet	54°C	50x20kg, 40x25kg, 1x500 kg
Ultra-Gut S80		Matrix coated Ca salt of butyric acid	Sodium butyrate 80%	Micropellet	54°C	50x20kg, 40x25kg, 1x500 kg

* under development

health concepts



Optigut

Patented feed additive

Villistar

Feed additive



Porcestin

Patented feed additive

ButriPro L

Drinking water additive



Optigut Aqua

Patented feed additive

CapriPro L

Drinking water additive



esterified fatty acids

Commercial name	Acid	pureLine	Technical name	Physical property at 20°C	Melting point (°C) (2)	Packaging
pure MP	C3	Monoglycerol ester	Monopropionin or Glycerol monopropionate	Liquid, water soluble	<-30	Bulk, IBC
pure TB	C4	Triglycerol ester	Tributyryn or Glycerol tributyrate	Liquid, water insoluble	-75	Bulk, IBC
pure TB S		Triglycerol ester on silica		Powder	n/a	40x25kg, 1x1000kg
pure MB		Monoglycerol ester	Monobutyryn or Glycerol monobutyrate	Liquid, water soluble	<-30	Bulk, IBC
pure MB S	Monoglycerol ester on silica	Powder		n/a	40x25kg, 1x1000kg	
pure 106	C6	Monoglycerol ester	Monocaproate or Glycerol monocaproate	Liquid, water insoluble above 0,1%	<-30	Bulk, IBC
pure 108	C8	Monoglycerol ester	Monocaprylin or Glycerol monocaprylate	Waxy paste	20-27	IBC
pure MC	C8- C10	Monoglycerol ester	Mix of monocapr(y)in or Mix of glycerol monocapr(y)ate	Waxy paste	30	IBC
pure MP MC	C3- C8- C10	Monoglycerol ester	Mix of monopropionin + monocapr(y)in or Mix of glycerol monopropionate + glycerol monocapr(y)ate	Liquid, water insoluble	10-15	Bulk, IBC
pure 110	C10	Monoglycerol ester	Monocaprin or Glycerol monocaprinate	Waxy paste	37	IBC
pure ML	C12	Monoglycerol ester	Monolaurin or Glycerol monolaurate	Powder	55-63	20x25kg