



- ▶ Easy to process
- ▶ Neutral flavor
- ▶ Highly soluble
- ▶ Excellent bioavailability
- ▶ Antimicrobial properties
- ▶ Applicable to all farm and marine animals

Corbion introduces CALFEED®: A highly soluble, bioavailable calcium source for animal nutrition

Calcium is an important constituent in all feedstuffs and is primarily used in order to aid formation of the skeleton. Calcium deficiency may result in foot and mouth problems or other disorders, potentially resulting in broken bones caused by a weak and brittle skeleton.

All calcium required by animals must be obtained through feed. Based on the results of balance studies, recommended daily intake levels per animal species have been defined.

Absorption of calcium occurs through the intestinal wall. For optimal absorption, calcium must be soluble. Growing animals need extra calcium in order to build up the skeleton. Lactating animals also need extra calcium in order to maintain a sufficient calcium level in the milk. Furthermore, there is a positive correlation between calcium availability and milk yield.

The most common sources of calcium in animal nutrition are carbonates and phosphates, despite the fact that both are calcium sources with low solubility. Corbion offers CALFEED; a highly soluble calcium lactate designed for use in animal nutrition.

Lactate has shown to be an excellent vehicle for calcium transport. Furthermore, research confirms that its calcium is highly bioavailable. Carbonate and phosphate have shown to be significantly less bioavailable due to their low solubility.

CALFEED fed to monogastrics will break down in the stomach to form Lactic Acid and calcium. In the intestine, amongst much higher pH levels, CALFEED becomes calcium, calcium lactate and free lactate. Free lactate is an important carrier enabling various nutrients to pass through the intestinal wall.

Calcium for pigs

To optimize calcium in pig nutrition, sufficient phosphorus must be available along with an adequate supply of vitamin D. The advised Ca/P ratio is app.: 1.25:1. A narrower ratio could improve the phosphorus utilization and a wider ratio the Calcium retention.

According to NRC (National Research Council), the estimated requirements for pigs from 20 kg to 50 kg are 0.6% calcium and 0.5% phosphorus. An in-feed inclusion of 0.10 - 0.15% calcium and phosphorus should be adequate. Addition levels should be higher for younger animals and somewhat lower for finishers. As phosphorus is considered to be an environmental pollutant it is recommended to add 500 units of phytase to the feed as this can reduce the required levels of calcium and phosphorus by 0.05% - 0.10%.

Extra calcium is also needed during pregnancy of sows. The total mineral content required by a litter doubles every 15 - 20 days of pregnancy. More than 50% of the total mineral requirement is required during the last two weeks of gestation. To minimize mineral deficiency in the sow, highly soluble calcium sources like calcium lactate can be used.

Recommendation for range of dietary additions for Calcium and phosphorus.

	Calcium (g)	Phosphorus (g)
Piglets up to 15 kg live weight (weaned)	7.5 - 9.2	7.0
Growing pigs of 15-50 kg live weight	6.0 - 8.2	5.0 - 6.4
Finisher pigs of 50-150 kg live weight	5.5 - 7.2	5.0 - 6.0
Gestating sows	7.0 - 9.0	5.5 - 7.5
Lactating sows	7.0 - 9.0	5.5 - 7.5

A highly soluble, bioavailable calcium source for animal nutrition

Calcium for poultry

The amount of calcium in a diet is an important economic factor. Inorganic Ca sources replace other nutrients and excessive dietary calcium interferes with the availability of other minerals like phosphorus, magnesium, manganese and zinc and may also negatively influence fat digestion. Recent publications suggest that an incorporation of 0.625 g Ca for elder animals and 1.0g for juveniles is sufficient for broilers.



In addition to the usual functions of calcium and phosphorus in poultry, successful eggshell formation requires approximately 5 to 6 grams of calcium carbonate to be deposited into the chicken eggshell. Eggshell mineralization is one of the most rapid biomineralization processes known. Some of the biological molecules, for which there is evidence of a regulatory role, are acidic in nature.

A well known result of calcium deficiency amongst layers is wind eggs. Various research studies (Damme, Gosset, Damron) show a positive correlation between supplementation of calcium as calcium lactate and egg shell quality.

Recommendation for range of dietary additions for Calcium and phosphorus.

	Calcium(g)	Non phytatephosphorus (g)
Layers	3 - 4.5	0.25 - 0.5
Broilers	1.0 - 1.3	0.25 - 0.50
Broiler Breeders	3 - 4.5	0.25 - 0.5
Turkeys Breeders	3 - 4.5	0.25 - 0.5
Ducks	0.8 - 1.0	0.2 - 0.4



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Calcium for fish & shrimp

Fish can absorb calcium directly from the surrounding water via gills or metabolize calcium through feed. As calcium lactate is highly soluble it can be applied either through feed or as calcium supplementation in water. Various research studies show a positive correlation between additional calcium lactate and fish performance.

Shrimp can absorb and excrete minerals directly from their aquatic environment via gills and body surface. Calcium levels in the feed need to be monitored in order to maintain a calcium phosphorus ratio of 1:1 or 1:1.5. Aside from the normal physiological functions, shrimp need calcium for exoskeleton formation.

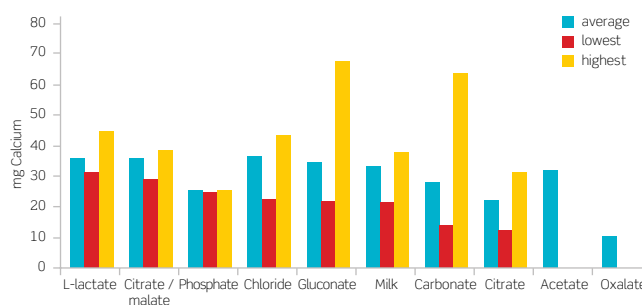
Calcium for ruminants

The rumen is an important place for absorption of calcium. Highly soluble calcium salts like CALFEED can be useful for preventing milk fever, especially for high yielding dairy cows.

Bioavailability of Calcium Lactate

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Bioavailability of Calcium sources (Levenson)



Sample Support

With R&D facilities on every continent, we are always close by to help you with your application development.
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For the animal health industry, Corbion offers Lactic Acid and Lactic Acid derivatives. Our ingredients are produced from renewable agricultural products and are used in a broad range of animal feed products. Lactic Acid is effective, safe and is well tolerated, it is naturally present in all living species.