

Fresh Cow

Professional Services Veterinarian Department Technical Bulletin



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Hypocalcemia or low blood calcium can cause what we know as milk fever and can be an important determinant of fresh cow health. It is usually linked to other fresh cow problems. Subclinical hypocalcemia (not showing clinical signs) actually has greater costs vs. clinical hypocalcemia. This is because there is a greater percentage of the herd affected. Second and greater lactation cows have a noticeable decline in calcium, highest being 12-24 hours after calving. Colostrum created (usually 10 L) contains 23 g of calcium or more. Blood calcium is used for skeletal muscle strength, gastrointestinal motility as well as muscle and nerve function. This can lead to a reduction in appetite, increases in metabolic diseases (DA's, Ketosis, etc.) and decreases in milk yield.

Stages of Milk Fever	Symptoms	Treatment	Special Note
Stage I:	Non recumbent; excitable, nervous, weak, shifts weight.	Oral calcium supplementation - if the cow is still standing, able to swallow or subclinical; will absorb calcium within 30 minutes; usually in bloodstream for 4-6 hours.	IV not recommended if the cow is still standing (rapidly increased blood calcium concentrations to extremely high and potentially dangerous levels). Usually have a relapse 12-18 hours later of very low calcium levels.
Stage II:	Down, but not flat out on their side, depressed, partial paralysis, usually with head turned into flank.	Treat immediately with slow (10-20 minutes) IV calcium 500ml of 23% calcium gluconate solution. This is more than enough to correct deficit; giving more than this has no benefit.	Transient hypocalcemia is whenever a cow goes off feed and has periods of decreased intestinal motility (decreased ruminal contractions). Treatment with oral calcium supplementation even in herds with anionic salts is beneficial.
Stage III:	Flat out on side, completely paralyzed, usually bloated, severely depressed.	After giving IV calcium, recumbent cows need oral supplementation once alert and swallowing and a 2nd dose 12 hours later to reduce relapse hypocalcemia.	High incidence milk fever herds will benefit economically to supplement all fresh cows with oral calcium. Cows with high milk yield in the previous lactation and lame cows have the best response to oral supplementation.

Milk Fever Prevention:

- Feeding extremely low calcium diets (<20g of daily calcium) before calving and high calcium diets after calving can drastically reduce milk fever and help the cow's body better respond to moving calcium around. Diets low in dietary cation-anion difference (DCAD) can also reduce milk fever incidence in herds with good intakes in pre-fresh group and ability to withstand a dry matter intake reduction.
- Dietary **magnesium** has an important role in maintaining calcium levels; Dietary intakes of 40-50 g of magnesium can reduce odds of clinical milk fever.
- **Vitamin D** helps the cow's ability to absorb calcium. Milk fever is typically not associated with insufficient vitamin D (it's an insufficient activation of an enzyme in response to parathyroid hormone). Cattle should get at least 20,000 IU daily.
- High **phosphorus** levels in the blood can bind calcium and lower blood calcium levels.

Source: "An Update on Hypocalcemia on Dairy Farms," Garrett R. Oetzel, DVM, MS, School of Veterinary Medicine, University of Wisconsin-Madison



Calcium Comparison Chart

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Product Feature	YMCP Vitall	Bovikalc	UltraCalc	Triple Calcium	Quadrical	Transition	CalCaps	Fresh Charger Gel Caps	Fresh Charger Gel
Brand	Tech Mix	BI	Huvepharma	Huvepharma	Bio-Vet	MAI Animal Health	VanBeeK	MasterVet	MasterVet
Calcium	44g	43g	44-48g	44g	54g	44g	44-55g	19.8-43.8 / 1500 lbs	54 g
Vitamin D	-	-	✓	-	-	✓	✓	✓	✓
Yeast	✓	-	-	-	-	-	-	✓	-
Magnesium	✓	-	✓	-	-	-	✓	✓	✓
Phosphorus	-	-	✓	-	-	-	-	✓	-
Calcium Sources	Calcium chloride Calcium carbonate	Calcium chloride Calcium sulfate	Calcium chloride Calcium carbonate Calcium sulfate Calcium phosphate	Calcium chloride Calcium propionate Calcium carbonate	Calcium chloride Calcium propionate Calcium sulfate Calcium lactate	Calcium chloride Calcium propionate Calcium carbonate	Calcium carbonate Calcium propionate Calcium sulfate	Monocalcium phosphate Calcium carbonate	Calcium chloride Calcium propionate
Conformation and Coating	-	Coating on bolus protects cow's throat	-	-	Tapered end	Tapered end and smooth coating	-	Bathe in mineral oil	Gel
Recommended dosage	2 doses 12 hrs apart	2 doses 12 hrs apart	2 doses 12 hrs apart	2 doses 12 hrs apart	5 boluses at calving; repeat 12-24 hrs later	2 doses 12 hrs apart	4-5 capsules pre- or post-calving	1-2 gel caps/ 500 lbs at calving; repeat 12 hrs as needed	1 tube 6-12 hrs pre- and post-calving
Boluses/dose	2	1	1	1	3	1	4-5	2-4 / 1000 lbs	1
Count per box	12	4 or 48	6	12	40	4 or 48	40/jar or 300/pail	20	1

Calcium absorption is greatly affected by source of calcium and its physical form:

- **Calcium chloride:** greatest ability to support blood calcium concentrations; high calcium bioavailability, able to invoke acidic response in cow mobilizing more of her own calcium stores; best in typical dose (50g) in small oral supplement which supplies about 4g to blood; 100g in water is too high a dose and is also caustic to upper respiratory tissues.
- **Calcium propionate:** more slowly absorbed (2nd best option), not acidogenic, must be given at higher doses of elemental calcium (usually 75-125g), sustains calcium longer, less caustic/irritating, provides gluconeogenic substrate.
- **Calcium carbonate:** poorly bioavailable (3rd best option), does not increase blood calcium at all in water, alkalogenic response invoked.

Timing of oral supplementation:

At least two doses; one at calving and one the next day (2nd dose gives the cow calcium when levels are at their lowest).

Please note: This information was gathered from the manufacturer's product labels. If you have further questions, please contact us.

