



Avoiding Hyperglycemia

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Reason: Hyperglycemia has a negative impact on abomasal motility and function (J Anim Sci 200; 78:1930-1935). Interestingly ketosis is closely linked to the occurrence of displaced abomasum in dairy cattle. Perhaps this is a consequence of hyperglycemia of treatment? The association needs to be established.

How do we get hyperglycemia in cattle?

- **Routine use of calcium-dextrose combinations, especially when given in a stressful period like within 48 hours of calving**
- **Steroid use at the same time a 500 cc bottle of 50% dextrose is administered**
- **IV dextrose for non-specific signs or fresh cow problems other than ketosis**
- **Multiple bottles of 50% dextrose over a few days or repeated 1 L bottles of concentrated dextrose solutions**
- **Use of 50% dextrose as a transport vehicle for antibiotics, vitamins or other treatments**
- **Repeated use of glucocorticoids several days in a row – Predef or dexamethasone**
- **Specific diseases like ruminal acidosis and BVDV have been associated with naturally occurring hyperglycemia that is exacerbated by dextrose administration**

Avoiding hyperglycemic treatments

- Reserve IV infusion of 50% dextrose for those cows with urine ketone level that is large (80-160 mg/dl) or milk BHBA concentrations 200 mg/dl or greater
- Reserve Predef, dexamethasone or other corticosteroid treatment for those cows that have uncomplicated ketosis. Usually these are the cows 20-50 DIM with intakes that don't match up with high milk production. Steroid administration in these cows curtails milk production, thus helping to resolve the negative energy balance.
- Ketosis that occurs in the first 14 DIM tends to be complicated and associated with fatty liver. Milk production in these cows is usually low and there is a high level of endogenous steroids. Therefore, additional steroids are probably not helpful and may contribute to hyperglycemia. Repeated steroid and/or IV dextrose treatments heighten the risk of developing hypokalemia (low potassium concentration).

- When steroids like Predef or dexamethasone are used, use them once and do not administer 50% dextrose at the same time – use a glucose precursor treatment like 8 oz of propylene glycol or a fresh cow drench at the time the steroid is administered.

A ketosis protocol that reduces the risk of hyperglycemia may look like this.

- 8 oz propylene glycol or fresh cow drench (recipe below) to cows that test small (15 mg/dl) or moderate (40 mg/dl) in urine ketones or 100-200 mg/dl milk BHBA. Treatment is repeated for 3 days as needed (positive urine or milk test). If three days of treatment does not resolve ketosis, call the veterinarian.
- 500 ml of 50% dextrose to cows with large (80-160 mg/dl) urine ketones or large (>200 mg/dl) milk ketones.
- Fresh cow drench with energy precursors (as shown below)

Fresh Cow Drench

(Adapted from Stokes and Goff, Hoards Dairyman Sept. 10, 2001)

To 5 gallon water, add the following:

Calcium propionate	1.0-1.5 lb
<input type="checkbox"/> Less irritating than CaCl ₂ ,	
<input type="checkbox"/> Slower elevation in Ca but more sustained	
<input type="checkbox"/> Also provides energy	
KCl	100-150 gm (0.22-0.33 lb)
MgSO ₄	200 gm (0.44 lb)
Sodium PO ₄	220 gm (0.5 lb)

Others ingredients that might stimulate rumen motility can be added.

- Ground feeds
- Fats
- DFM
- Yeast