

## Colostrum: Tube vs. Bottle Feeding

- **Volume fed by bottle vs. tube feeder makes a difference in passive transfer success.**
- **Smaller volumes (1.6 quarts) fed by tube feeder may result in high rates of passive transfer failure.**
- **Proportion of 4 quarts fed by bottle or tubed does not make a difference in passive transfer success.**

Set aside for a moment the issues of the calf care person's competency in using an esophageal tube feeder and subsequent interest on the part of the calf in nursing from a bottle. Focus on the immunity outcome of feeding colostrum.

### **Volume fed by bottle vs. tube feeder makes a difference in passive transfer success**

In a research project all calves were fed colostrum replacer within two hours of birth. Colostrum replacer made from colostrum containing 100 grams of IgG antibodies per package was fed to rule out variations in colostrum fed. Calves were fed either one package (1.6 quarts = 100g IgG) or two packages (3.2 quarts = 200g IgG) in one feeding.

Note especially the bottom line in Table A below (**bold print**). When fed the larger volume (2 packages or 3.2 quarts) there was no significant difference in passive transfer due to method of feeding. **When only fed one package (a total of 1.6 quarts volume) fifty-eight percent of the calves fed by esophageal tube feeder had passive transfer failure.**

Table A. Passive transfer indices for newborn calves fed either small (1/6 Qt.) or large (3.2 Qt.) volumes of colostrum replacer using either a bottle or an esophageal tube feeder.

	Treatment		Group	
Parameter	1.6 Qt by bottle	1.6 Qt by tube	3.2 Qt by bottle	3.2 Qt by tube
# of Calves	24	24	24	25
Total IgG fed	100 g	100 g	200 g	200 g
24 hr sample				
Total serum protein (g/dL) average	5.3	5.0	5.8	5.9
Efficiency of absorption (%)	51	40	41	39
<b>Calves with passive transfer failure (%)</b>	<b>None</b>	<b>58%</b>	<b>None</b>	<b>None</b>

Table adapted from Godden, S. M., D.M. Haines, K. Konkol and J. Peterson, "Improving passive transfer of immunoglobulins in calves. II: Interaction between feeding method and volume of colostrum fed." Journal of Dairy Science Vol. 93 No. 4 1758-1764.

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These researchers noted that sixty-eight percent of the bottle-fed calves fed 3.2 quarts drank all of it by bottle. If they did not finish all 3.2 quarts the balance was tube fed.

Those that drank the entire feeding by nipple bottle were compared with those drank part of the 3.2 quarts and had to have the balance tubed. The efficiency of absorption was equal for both groups.

**Proportion of 4 quarts fed by bottle or tubed does not make a difference**

Calves were fed colostrum less than one hour after birth in varying proportions either by nipple bottle or esophageal feeder (see Table B below). The proportion fed by either method alone or mixed methods did not make a difference. The efficiency of absorption was essentially equal for both groups (see bottom line in **Bold print**). None of the calves had passive transfer failure.

Table B. Description of treatments and blood parameters at 24 hr of age in calves fed colostrum by nipple bottle, esophageal feeder or a combination of both.

	Treatments				
Item	1	2	3	4	5
# of Calves	13	6	7	7	7
Amount Fed, Qts., by Method of Feeding:					
Nipple Bottle	4	3	2	1	0
Esophageal feeder	0	1	2	3	4
Antibodies (IgG) g/L in colostrum	23.4	24.5	25.6	24.0	25.8
Total serum protein (g/dL)	6.3	6.6	6.5	6.6	6.3
<b>Efficiency of Absorption</b>	<b>35</b>	<b>35</b>	<b>36</b>	<b>32</b>	<b>35</b>

Table adapted from: J.A. Elizondo-Salazar and A.J. Heinrichs, “Feeding colostrum with an esophageal feeder does not reduce IgG absorption in neonatal dairy heifer calves.” ADSA Poster presentation M34, Monday July 13, 2009.

**Bottom line: As long as you get plenty of colostrum into calves soon after birth the feeding method does not affect the transfer of antibodies.**