

# What Should You Put in the Cria Baby Bottle?



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BY SHEILA SCROGGINS

Conventional wisdom says cow or goat milk is a good substitute for alpaca milk. My research indicates neither of those are the most optimum milk substitute. Recently, we bottle fed a cria for two months with a unique formula that produced good results. I pursued further research to see if my choice of formula had real validity. What I learned may help others with bottle-fed crias.

I had read in multiple sources that cow's milk was one of the acceptable choices for supplementation. However, I did not feel comfortable with that choice. As a nurse practitioner, I know that using pasteurized cow's milk as a sole source of nutrition has its limitations. Numerous sources recommended adding yogurt to increase the protein content in cow's milk, but both products have nearly identical protein and fat concentrations so I couldn't see that adding yogurt would actually increase protein concentrations(3). I *did* see the value in adding yogurt for its microbe benefits.

Our dam had previously lost a cria to sepsis and dehydration the year prior. We were worried from the onset that this dam may have had lactation problems with her first cria. Her second cria arrived and we monitored its weight every 12 hours during the first two days. Just as we had suspected, the dam's milk production was insufficient, and by 48 hours after birth we knew we were going to have to supplement. Fortunately, the dam did appear to be producing colostrum in the first 12 hours. As is our routine, the cria received fresh frozen bovine colostrum.

The cria was supplemented with milk in the first month with five to 10 percent of body weight volumes, depending upon the prior day's weight gain. The dam was clearly producing milk but the amount vacillated from day to day, and she never produced sufficient amounts to attain the desired .25 to .50 pound daily weight gain. We were fighting to maintain the cria's growth, but attempting not to supplement it in excess of what the dam was producing. We wanted to keep the cria nursing in order to stimulate the dam to continue milk production.

After two weeks, we started the dam on Domperidone, a drug used to promote lactation. Domperidone was administered at the recommended dosing and intervals for the next 21 days. During this Domperidone dosing period, we saw a steady increase in cria weight with a corresponding decrease in supplemental volumes of milk. This steady improvement in lactation

on the part of the dam continued until two months after birth, at which time we had gone from feeding a maximum of 40 ounces of milk a day down to five ounces, with adequate weight gains. At two months we were able to cease supplementing entirely.

Figure 2 compares the fat, carbohydrate and protein content of the milk of different mammalian species.(1)(3).

As you can see from the graph, the protein content of alpaca milk compares best with that of sheep milk (1)(3)(15)(16). Figure 2 also shows that one of the poorest equivalencies for protein is between cow and alpaca milk. The importance of protein content in milk for the growing cria cannot be overstated.

In looking at the effectiveness of milk replacement formulas, we cannot just look at simple weight gain when supplementing. We must also be judicious in supplementing with a milk formulation that has sufficient protein levels for optimum growth and develop-

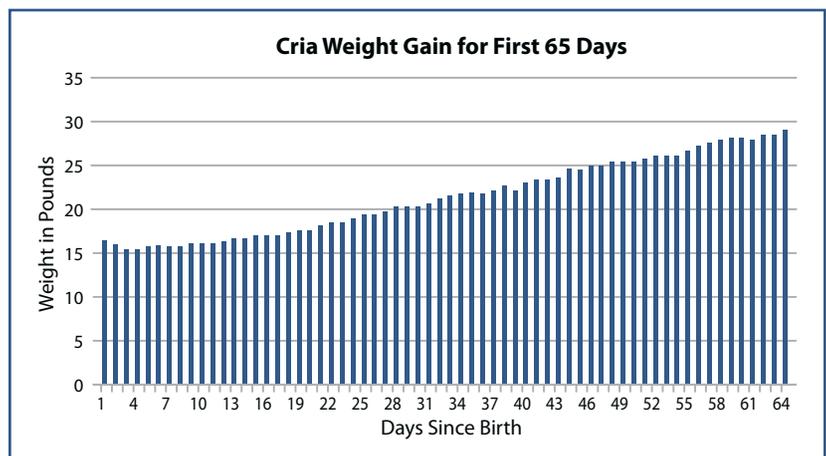


Figure 1. Cria weight gain for the first 65 days.

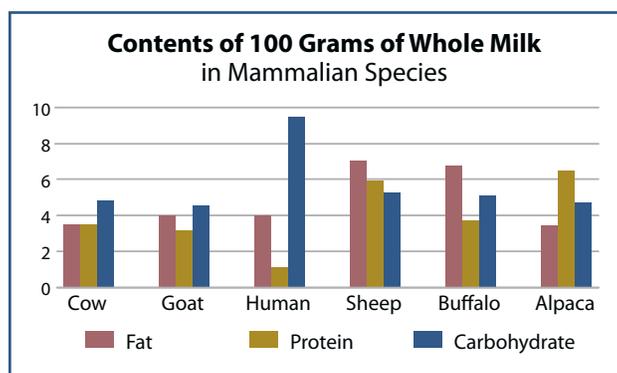


Figure 2. The content of 100 grams of whole milk in different mammalian species.

ment of a rapidly maturing cria (11)(4)(5).

Dr. Robert Van Saun, in his article “How Well Are They Growing,” writes that we have little objective data on the ideal alpaca weight gain. He concludes that this lack of information limits our “ability to generate models capable of estimating amounts of nutrients required in support of growth.”(4)

I agree with Dr. Van Saun in his remarks, but believe we can, with some basic comparisons, make informed choices in cria formulations using our knowledge of basic alpaca milk composition. A 2003 study done in Chile measured the protein content of 100 grams of whole alpaca milk at between 6.0 and 7.0 grams. I used this information as the basis of my comparison (15).

It seems a reasonable assumption that feeding cow’s milk, with its lower protein content, even with the addition of yogurt, would provide significantly less protein, less than 50 percent of the physiological growth needs of the very young alpaca. This substantial reduction of protein content in the diet of a rapidly growing cria could certainly result in growth retardation. Therefore, I would say that cow’s milk should not be our exclusive choice for supplementation, especially not for a cria that is being totally bottle fed.

In Figure 2, carbohydrate amounts in all species, with the exception of humans, are similar to the alpaca (3)(11)(15)(16). Fat content is very similar between goat, cow and the alpaca (16). The only significant variation that differs greatly when comparing lamb’s milk to alpaca milk is the fat content. The comparison of nutrient ratios shown in Figure 2 leads me to believe that the best selection for replacing alpaca milk is one formulated for sheep.

I then looked at a commercial lamb milk replacement formula that is available called Manna Pro’s Lamb Milk Replacer, made by Manna Pro Products, LLC (www.mannapro.com). A potential problem with this formula is that it has more fat than what is needed for alpacas. A commercial alpaca milk replacement formula is available, through Grober Nutrition, Inc. (www.grobernutrition.com). This formula has nearly the equivalent amount of fat as Manna Pro’s lamb formulation.

For our cria, we used a combination of cow’s milk in a fifty percent ratio to lamb’s milk. This provided an increase in protein concentration but also lowered the fat content of the lamb milk replacer formula. To this mix we added plain yogurt. In the first two weeks, we also added one ounce of fresh frozen bovine colostrum to each of the four to five bottles we fed daily.

Many alpaca owners, including us, give bovine colostrum in the first 24 hours after birth. There

### Diseases included in Dairy Cattle Vaccination Programs

- ■ ■ Clostridium
- ■ ■ Vibriosis (Campylobacter)
- ■ ■ Leptospirosis
- ■ ■ Brucellosis
- ■ ■ Bovine Viral Diarrhea
- ■ ■ Bovine respiratory disease complex (BRDC) or shipping fever
- ■ ■ (Pasteurella, Mannheimia or Haemophilus somnus)
- ■ ■ Infectious bovine rhinotracheitis
- ■ ■ Parainfluenza-3 (PI3)
- ■ ■ Bovine respiratory syncytial virus (BRSV)
- ■ ■ Pneumonia (viral and/or bacterial)
- ■ ■ Anthrax
- ■ ■ Anaplasmosis
- ■ ■ Trichomoniasis
- ■ ■ Mastitis: *Staphylococcus aureus*
- ■ ■ Pinkeye

Figure 3. A list of diseases for which dairy cattle are routinely vaccinated.

may be a benefit for the cria to continue to receive colostrum in the first few weeks after birth if the cria is bottle fed (2)(7)(10)(14). In human clinical trials, oral doses of hyperimmune bovine colostrum have shown significant promise in treating and preventing bowel infections in young children as a substitute for antibiotics (14). The first dose of colostrum we gave was to promote IgG passive transfer but the dosing for the next 14 days was to protect the cria from any bowel pathogens that might cause diarrhea or sepsis in this potentially susceptible cria.

Stelwagon, et al, wrote in the *Journal of Animal Science* in 2009, “Increasingly, immune components from colostrum and milk are being exploited commercially as antimicrobial agents. Moreover, vaccination procedures to boost the natural concentrations of immune components offer great potential in the development of hyperimmune milk-derived products for prophylactic or therapeutic use in humans.” (2)

Hurley, et al, state, “There also are a number of examples of the use of bovine immune milk products in the treatment or prevention of human disease, especially in cases where the pathogen acts by way of the gastrointestinal tract.” (10)

Medical evidence is accumulating that bovine colostrum that is hyperimmune as a result of multiple, frequent vaccines, can serve as a prophylactic treatment against pathogens. In particular, bowel parasites and pathogens seem susceptible to this new unique therapy (2)(7)(10)(14).

Dairy cows are probably the most hyperimmune mammal because their milk is used for human consumption. As shown in Figure 3, fresh first-milking dairy colostrum would be considered hyperimmune

simply because of the number of immunizations that are used routinely in dairy cattle (6)(9)(11).

Some of the same pathogens known in alpacas can also be found in the bovine. An example of one pathogen would be the Bovine Viral Diarrhea Virus (BVDV) (2). To my knowledge there is no research to date into the use of hyperimmune bovine colostrum in the newborn cria. However, there is also no reason to believe the promising research on the application of hyperimmune bovine colostrum in human disease prevention can't be applied to the alpaca.

Use of fresh bovine colostrum does come with some risk (8)(12). One of those risks is the transmission of Johne's disease, which is a serious, untreatable disease in the bovine. The prevalence of Johne's disease in dairy cattle is not clearly known, but we do know that it can be transmitted through colostrum from an infected cow (8). Many dairy farms have stringent prevention programs for Johne's disease and some dairy farms screen their cattle for Johne's disease. Some farms can and do certify their dairy cattle are Johne's free (12). If you decide to use fresh frozen bovine colostrum, it would be prudent to get it from a dairy farm that has a Johne's certification, or only buy colostrum from a verified Johne's-free animal.

More information and better product availability is definitely warranted for a readily available, cost-effective alpaca milk replacement formula specific for the species. Grober Nutrition, Inc., produces an alpaca milk formula utilized by zoos and exotic animal farms. The wholesale cost of this alpaca replacement milk is \$2.58 per pound, which does not include freight charges (13). Grober requires a minimum order of 200 pounds of product. The price per pound of Grober's milk equals that of the more common lamb milk replacer, such as Manna Pro's, which sells for about \$2.50 per pound. Unfortunately, Grober's minimum order requirement makes ordering unrealistic for the small alpaca farmer. However the formula could be shared among multiple ranches and is certainly an option for large ranches.

As a nurse practitioner, I caution new parents who are not breast feeding, not to feed their newborn cow's milk in lieu of infant formula. I think the same recommendation is applicable to the parents of a newborn alpaca.

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