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Calf Note #253 – Later Weaning Ages?

Introduction

A weekly email newsletter from the American Dairy Science Association (link here) reported that weaning calves at an older age "was superior" to earlier weaning. The article contained a link to a Hoard's Dairyman article (link here) that summarized a couple of interesting papers from the Journal of Dairy Science from the University of British Columbia (Welk et al., 2022, 2023, 2024) that discussed methods of weaning and their effects on health and growth of calves. In 2019, the same group (Neave et al., 2019) reviewed animal characteristics (calf viability, drinking ability, learning speed, etc.) and their effects on weaning ages, when weaning was based on intake.

I am still bemused by the focus on weaning age.

From a purely nutritional perspective, weaning in ruminants should only occur when the digestive system (especially the reticulorumen) is sufficiently developed to provide sufficient nutrients to replace nutrients from the liquid diet. Further, peripheral systems (liver, muscle, adipose tissue) must adapt from a monogastric-type digestion to that of rumen fermentation, including production of VFA and microbial protein, and limited supplies of peripheral glucose. Few of these metabolic changes are associated with age, but are all driven by consumption of solid feed (especially calf starter) and production of VFA in the rumen.

Therefore, our focus should be on the how much starter – and non-fiber carbohydrate (**NFC**) from the starter – is consumed. This drives development of the rumen and allows the calf to digest nutrients such as NDF and starch. This ability is critical to successful weaning. If a calf is weaned prior to "sufficient rumen development", it will struggle to grow and will experience stress. This is often referred to as "post-weaning slump". In my experience in visiting dairies all over the world, I see this occurring with greater frequency as producers feed greater amounts of milk or milk replacer, but don't adjust weaning ages to correspond for the lower starter intake that occurs with high levels of milk feeding.

In 2019, our research group published a pair of papers in Journal of Dairy Science that identified "sufficient rumen development" based on changes in dry feed nutrient digestibility (Quigley et al., 2019a,b). We found that when calves consumed a total of 15 kg of NFC from calf starter, the rumen had developed sufficiently so the calf could be weaned without experiencing post-weaning slump. I discussed this in more detail in Calf Note #209.

Unfortunately, on farms, we don't typically measure calf starter intake, nor NFC intake. Therefore, we are at somewhat of an impasse. How to determine when calves are ready to wean?

One option is to simulate the intake of starter and NFC using growth and intake models. There are several calf nutrition models available, including NASEM and the Cornell system. In Calf Note #224, I made available an Excel spreadsheet that allows you to calculate when calves reach 15 kg of cumulative NFC intake.

Another option is a simulation from the University of Vermont can do the trick. The simulation is named "CalfSim" and is available from the lab Dr. Joao Costa. Programmed by Dr. Tadeu da Silva, CalfSim allows the user to input the type of liquid feeding program and starter. The program then predicts nutrient intake

from liquids and dry feeds and calculates the total NFC intake. It reports the age at which calves are ready to be weaned. A link to CalfSim is here. It's easy to understand and use. And it's free.

Summary

While we need to manage weaning on the basis of age, we can and should use available tools to determine when that age is reached. Calf raisers should work with their nutritionists to model their liquid programs and determine the appropriate time of weaning – when the calf is ready. Whether you use the Excel spreadsheet from Calf Notes or CalfSim from the University of Vermont, the result will provide you with an excellent estimate of when calves are ready to be weaned. We can then focus on the appropriate step-down method to reduce weaning stress and provide the calf with an easy transition to dry feed. Maybe we can then reduce our focus on "this age" or "that age" and look at weaning from the perspective of the calf.

References

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