



BOTTOM LINE DAIRY: Transitioning from components to TMR after weaning

Whether to mix grass hay with starter postweaned, and when, is addressed in this study.

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The transition after weaning to inclusion of forage in diets is problematic. Feeding too much forage too soon can result in decreased intake and daily gain, and gut fill which distorts true body growth. The 2014 NAHMS found that dairy farms could not wait to begin feeding forage on average beginning at 35 days, with larger dairy farms waiting until later at about 60 days. The 2018 NAHMS study (Urie et al., 2018) of 104 dairy operations in 13 US states revealed that while daily gain was 1.61 lb prior to weaning, it decreased to 1.32 lb for the month postweaned for 2,273 Holstein calves. This decreased daily gain post weaned could be due to poor starter intake and rumen development, and feeding too much forage too soon—or to both.

A previous study (Overvest et al., 2016; Kertz 2016) fed a TMR with DM comprised of 37% corn silage, 34% red clover hay, 16% high moisture corn, and 13% protein concentrate along with rumensin resulting in 15.2% protein, 21.4% ADF, and 31.7% NDF on an as-fed moisture basis; a texturized starter with 20% protein mixed with 15% chopped <2.5 cm grass hay (8.3% protein, 38.6% ADF, and 61.1% NDF); the same as the mixed except the chopped hay and starter were fed separately; and just the starter as a control. Feeding forage with a well-texturized calf starter is not necessary or beneficial during the first 2 to possibly 3 months based on this study. But a texturized

starter was used. And feeding a TMR, especially with 71% forage, decreases DMI, daily gain, and most likely leads to gut fill during the first 3 months for calves.

A more recent Penn State study (Mitchell et al., 2020) used 40 postweaned Holstein calves (32 female and 8 male) beginning at 7 weeks through 14 weeks. They had been previously weaned after 6 weeks. The diet consisted of a “texturized” starter and 15% coarse chopped grass hay. The starter analyzed 23.5% CP, 8.7% ADF, 20.3% NDF, and 27.6% starch. However, its texture was from 18.6% roasted flaked corn and 2.6% whole oats. That is only about one-half of what I think a well-texturized starter should contain. In another study (Khan et al., 2011; Kertz 2011), a starter labelled as “texturized” contained on an as-fed basis “57.5% concentrate pellet, 14% flatted barely, 13% flatted oats, 10% steamed corn, and 3.5% molasses”. That starter was inadequate to keep rumen pH from being above 5.06. And when hay was also provided, while calves had similar body weights, the hay increased gut fill by 10.4 lb, distorting true body growth.

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contained on DM basis 13.7% CP, 37.0% ADF, and 57.1% NDF versus the final grass hay content of 8.4% CP, 41.8% ADF, and 65.3% NDF. The saving grace was that hay only comprised 15% of total diet. Twenty-four calves were housed in individual sawdust bedded hutches while 16 calves were

housed in a mechanically ventilated tie-stall barn for digestion and rumen pH measurements. These calves were on rubber mats with only the rear portion of the stall bedded with sawdust to prevent consumption by calves. The 4 treatments were no total mixed ration (TMR), and conversion to TMR at either 8, 10 or 12 weeks of age. Trial length was 14 weeks. Empty body weight gain (EWBG) was estimated using the classic study of Jahn and Chandler (1976).

At first glance (**Table**), there seems to be little differences among treatments in daily gain, hip growth, DMI and feed efficiency although it appears that the 8-week treatment was a bit lower than the other treatments in these areas. But calves fed grass hay in TMRs had more ($P<0.001$) grass hay intake than when that hay was fed separate from the starter. All of this might indicate that calves first fed the TMR at 8 weeks did not have adequate rumen development to handle the 15% grass hay in TMR form then as opposed to the later introduction of grass hay in TMRs. On the other hand, it could be speculated that calves first fed the TMR at 8 weeks had a more desirable daily gain at 2.29 lb than the other treatments around 2.5 lb daily gains. Those daily gains are more likely to result in over conditioning and some fattening. Or perhaps this indicates that calves provided TMRs after 8 weeks were better able to handle 15% grass hay; and if had been increased to above 15%, that would have decreased daily gain to a more desirable 2.25 lb as seen with the 8-week treatment.

Digestibilities were also measured at weeks 9, 11, and 13 for all treatments. In general, ADF and NDF digestibilities were greater for calves fed TMR than for those fed components separately, and most notably at the 9-week measurement. That is most likely because when the starter was consumed separately, that would have resulted in faster fermentability in the rumen, a lower pH, and consequently lower fiber digestion at that lower rumen pH. Rumen pHs progressively increased as introduction of TMRs were delayed from 8 to 12 weeks.

A final caveat. I noted earlier in this column that while this starter was categorized as “texturized”, it only contained about 21% texture—about one-half of what I think it should be. Nevertheless, that is better than zero texture. But whether the starter is texturized or not can affect results when rumen development and function is in its early phase. Similarly, Overvest et al., 2016, fed a texturized starter in their study related to TMR or components fed separately or mixed. The impact of starter physical form on intake and performance is what prompted me to note this issue in a Letter to Editor (Kertz 2017). At best, it has been a mixed bag as to whether published studies considered that entreaty in designing studies or interpreting results.

Table.

Treatment week	0	8	10	12	SEM
Initial weight, lb	148.4	135.6	133.4	136.3	3.63
ADG, lb	2.55	2.29	2.51	2.55	0.22
EBWG, lb	2.36	2.05	2.25	2.29	0.20
Initial hip width, inch	8.11	7.76	7.72	7.76	0.10
Hip growth, inch	0.33	0.30	0.32	0.33	0.03
DMI, lb/day	6.78	6.14	6.50	6.63	0.24
Grass hay	0.51	0.86	0.75	0.59	0.24
Starter	6.27	5.28	5.72	6.01	0.24
Feed efficiency	0.39	0.38	0.41	0.40	0.03

The Bottom Line

Whether to mix grass hay with starter postweaned, and when, was addressed in this study. Introducing the 15% hay mixed with starter in a TMR at 8 weeks postweaned rather than waiting until 10 or 12 weeks seemed to be the best timing. Waiting later may lead to some over conditioning unless the hay would be increased to more than 15 % in the TMR.

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