

Best Practices for Weaning Calves

DHMCP
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What is our challenge?

- How do we apply concepts of natural behavior to modern production?

Birth to weaning...

- At first digestive system is suited to digest only milk
- As calf matures... system adapts to be able to digest solid feeds
- First 3-4 weeks are critical for milk intake... very little, to no solid intake occurs

A calf needs access to milk in sufficient quantities...

Immediate and long-term effects...

- Lesser indication of stress (Thomas et al., 2001; Krachun et al., 2010)
- Improved immune function (Smith et al., 2002)
- Improved efficiency of feed conversion (Jasper and Weary, 2002)
- Earlier age at first breeding (Raeth-Knight et al., 2009)
- Improved lactational performance (Soberon and Van Amburgh, 2013)
 - 1,550 kg more milk were realized in the first lactation for each 1 kg difference in ADG during the first two months of age

One of the biggest challenges we have (especially when feeding appropriate levels of milk) is successful weaning...

Weaning...how does this occur for the calf?

Weaning off milk...

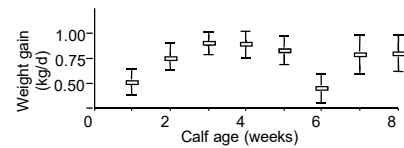
- Undernourishment may occur if calves do not consume and digest sufficient quantities of solid feed

Weaning off milk...

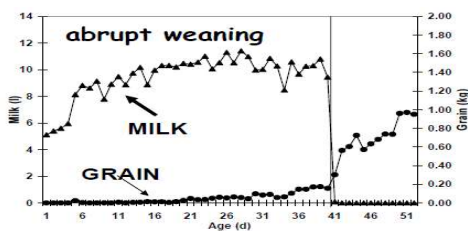
- Need to consider methods of improving solid feed consumption...
 - Method of reducing milk intake
 - Timing of weaning
 - Type of feed consumed
 - Water
 - Housing management

Method of weaning...

- Abrupt weaning can result in severe growth check due to lack of nutrient intake in the period following weaning (Weary et al., 2008)

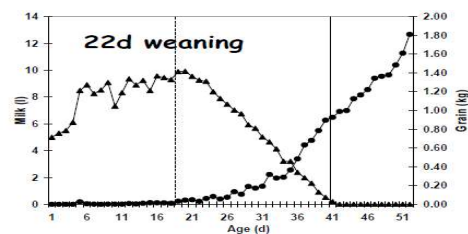


Abrupt weaning initiates solid feed consumption only after weaning...



Sweeney et al. 2010, J. Dairy Sci. 93:148-152

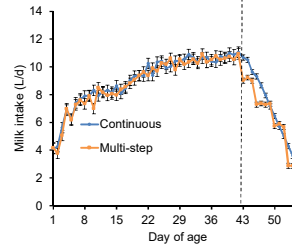
Gradual weaning encourages earlier increase in solid feed intake...



Sweeney et al. 2010, J. Dairy Sci. 93:148-152

Does the type of gradual weaning program matter?

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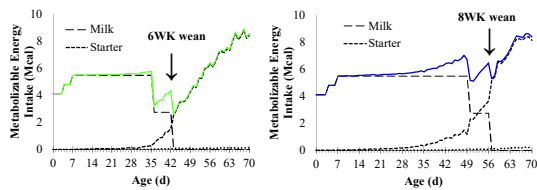


Parsons et al., in preparation

This is where technology is beneficial....

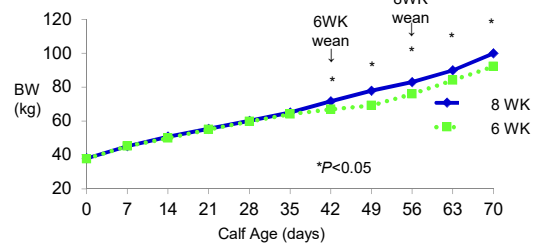
Another simple way to encourage more solid feed intake is to wean later...

Intake of metabolizable energy intake is maintained across weaning when weaning later...



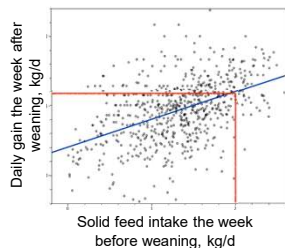
Eckert et al. 2015, J Dairy Sci 98: 6315-6326

As result, growth rate is maintained through weaning...



Eckert et al. 2015, J Dairy Sci 98: 6315-6326

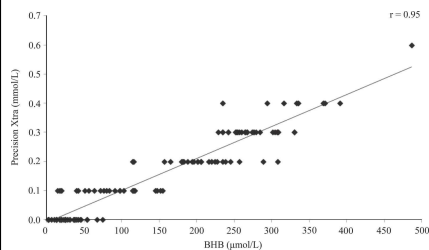
When to wean is dictated by how much you want calves to grow after weaning...



Source: Alex Bach, IRTA

How do we know how much feed is being consumed by group-housed calves?

Starter consumption and rumen function can be estimated from blood BHB



1000 g of starter intake was predicted with a value of **0.2 mmol/L** on the Precision Xtra test with sensitivity of 84.0% and specificity of 97.2%

Deelen et al. 2016, J. Dairy Sci. 99:7624-7633

What type of solid feed do calves need?

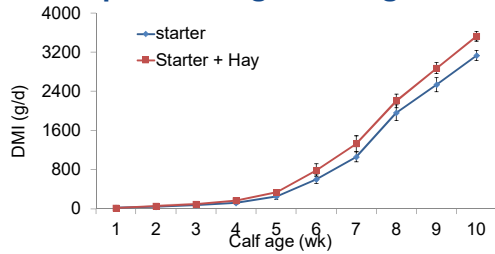
What impact does solid feed play in promoting growth and successful weaning?

- Establishes fermentation in the rumen, which initiates the process of physical and metabolic development of the rumen (Baldwin et al., 2004)
 - Starter concentrate
 - VFAs and papillae growth
 - Fiber/forage
 - rumen wall muscle and volume

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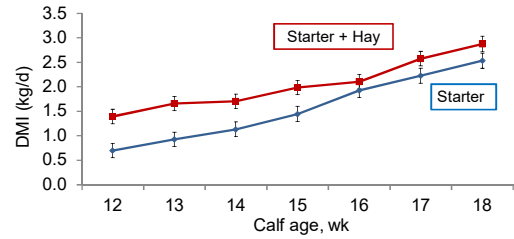
- The most common recommendation for feeding calves is to offer just starter and no forage before weaning (NRC, 2001)
- Evidence from several researchers (Khan et al., 2011; Castells et al., 2012; Castells et al., 2013; Daneshvar et al., 2015) indicates that offering chopped forages (2-3 cm) may increase total intake

Forage access early in life promotes solid feed consumption through weaning...



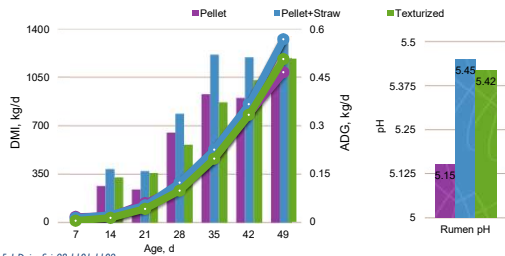
Khan et al. 2011, J Dairy Sci. 94:3547-3553

Forage access early in life promotes solid feed consumption post-weaning as well!



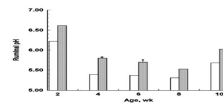
Khan et al. 2012, J Dairy Sci. 95:3970-3976

Early forage access improves growth, intake, and rumen pH



Terré et al. 2015, J Dairy Sci. 98:1101-1109

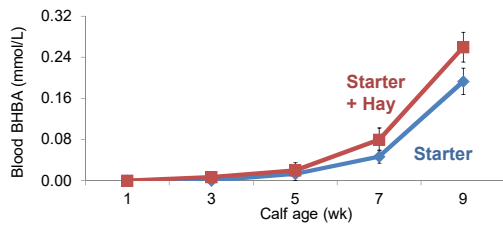
Early forage access minimizes acidosis and improves papillae health and function



Beitarvand et al., 2014, J Dairy Sci. 97:2270-2280

Beharka et al. 1998, J Dairy Sci. 81:1946-1955

Early forage access does not delay rumen metabolic development



Khan et al. 2011, J Dairy Sci. 94:3547-3553

Physical form of the forage plays a role in growth and behavior...

Feeding coarse (3-4 cm) vs fine (2 mm) grass hay with concentrate...

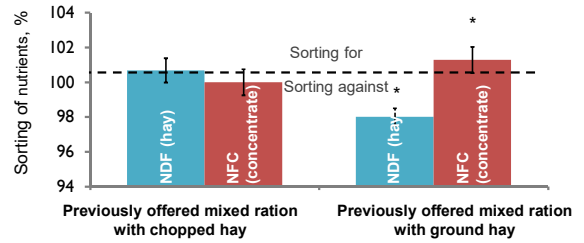
Montoro et al. 2013, J Dairy Sci. 96:1117-1124

Providing physically-effective forage improved ...

- Gain-to-feed ratio
- Feed intake post weaning
- Total tract nutrient digestibility post weaning

Montoro et al. 2013, J Dairy Sci. 96:1117-1124

Difference in physically effectiveness of forage affected sorting post weaning...

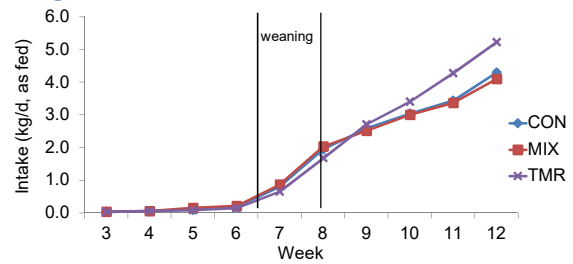


* P<0.05

Adapted from Miller-Cushon et al. 2013, JDS: 96:3257-3264

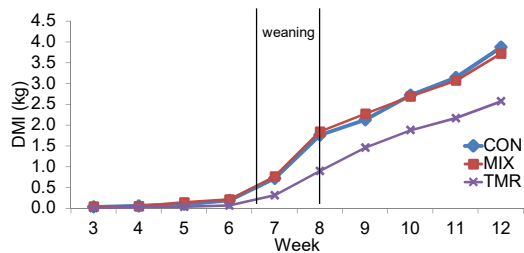
Need to be careful with the type, amount, and length of the forage...

Need to be careful with the types of forages...



Overvest et al. 2016, J Dairy Sci. 99:317-327

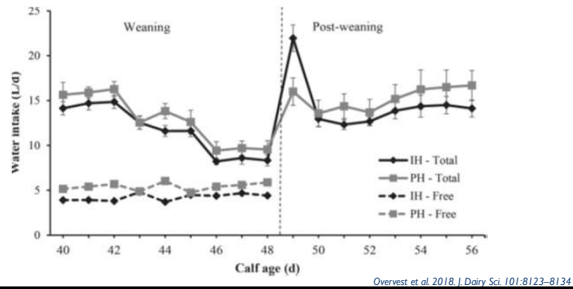
Need to be careful with the types of forages...



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Don't forget water for milk-fed calves...

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What else helps promote a smoother weaning transition?

Take home messages:

Ensure weaning success in dairy calves...

- Use a gradual weaning program
- Wean at an age that optimizes growth post-weaning
- Ensure calves eat quality starter... but also consider role of physically-effective forage
- Don't limit water intake
- Group house calves where possible

QUESTIONS???



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