

Los terneros y el agua: 4 razones para ofrecerles agua desde el primer día

Dra. Jennifer Trout for *Progressive Dairy*

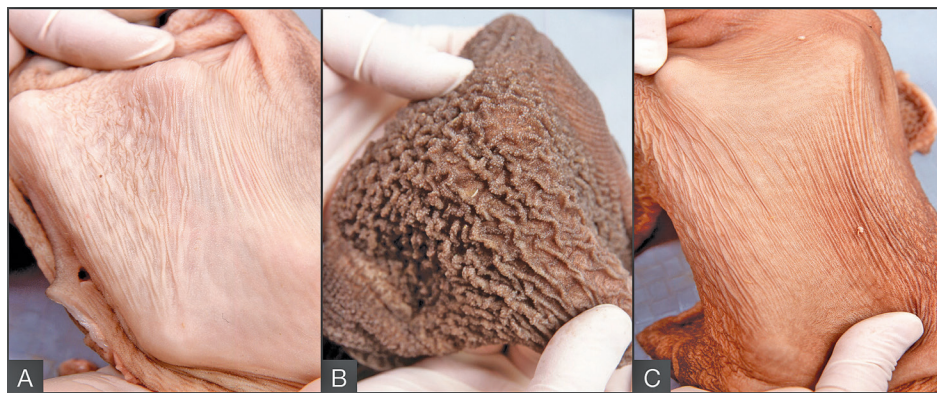
Según la última encuesta del Sistema Nacional de Supervisión de la Salud Animal, los terneros de los tambos estadounidenses, en promedio, no reciben agua para beber hasta los 17 días de vida.

¿Por qué esperar? En algunos establecimientos se cree que los terneros reciben toda el agua que necesitan de la leche o el sustituto de la leche. Sin embargo, esto no es verdad. Cuando los terneros toman leche, una respuesta orgánica hace que la leche se desvíe directamente hacia el abomaso a través de la gotera esofágica, sin pasar por el rumen. Esto continúa hasta aproximadamente las 12 semanas de vida.

Continúa en la parte de atrás

FIGURE 1

Desarrollo de las papilas ruminales a las seis semanas en terneros alimentados solo con leche (A), con leche y granos (B) o con leche y heno (C)



Source: Penn State University.



Foto cortesía de Cargill.

Consejos para ofrecer agua

- 1** Ofrézcala desde el primer día.
- 2** Use un cubo menos profundo para los granos y el agua durante la primera y la segunda semana para que las terneras aprendan dónde están el agua y el alimento.
- 3** Use cubos de colores más suaves (en mis visitas a tambos he visto que las terneras prefieren los cubos de colores claros en comparación con los de colores oscuros).
- 4** Coloque una división entre los cubos de agua y de alimento o sepárelos lo suficiente para evitar que lleven alimento al cubo de agua y viceversa.
- 5** Revise los momentos de distribución de agua semanalmente. Controle con sus empleados que la leche, el agua y los granos se administren según el cronograma.
- 6** Ofrézcales agua limpia todos los días, en cubos limpios y con la frecuencia que sea necesaria.

Los terneros y el agua: 4 razones para ofrecerles agua desde el primer día, continúa desde el frente

Cuando un ternero toma agua, no se produce la estimulación nerviosa que activa la gotera esofágica, y el agua ingresa al rumen. El agua junto con las bacterias y las partículas de alimento que el ternero ingiere generan fermentación y el desarrollo del rumen.

¿Por qué esperar si el agua es gratis y esencial para el ternero? El agua es necesaria para el desarrollo del rumen y la digestión de granos y forrajes, y prepara a las terneras para producir leche en el futuro.

1 El agua es esencial

El agua es el nutriente más importante para el cuerpo de cualquier animal. En un ternero, el agua equivale al 50 % de su composición corporal total (al nacimiento es del 80 %). Es más, el agua es el nutriente que se necesita en mayor cantidad. Se debe ofrecer agua a libre demanda desde el primer día, cuando los terneros se trasladan a cobertizos u otros tipos de alojamiento. Más allá de la función orgánica, el agua es necesaria para el desarrollo del rumen, el inicio de la ingesta de granos y la preparación del ternero para un buen resultado luego del destete.

2 Desarrollo del rumen

Es como si estuviera alimentando a dos terneros. El ternero actual, que es monogástrico, y el futuro ternero, que necesitará desarrollar el rumen para digerir los granos, el ensilado y otros forrajes. El abomaso del ternero digiere la leche y los nutrientes necesarios para el crecimiento y el aumento de peso actuales. Simultáneamente, el agua y los granos que se le administran se digieren en el rumen y preparan al ternero para seguir creciendo y aumentando de peso en el futuro.

La Universidad del Estado de Pensilvania comparte esta comparación (**Figura 1**) del desarrollo de las papilas ruminales a las seis semanas en terneros alimentados solo con leche (A), con leche y granos (B) o con leche y heno (C). Al observar estos tres rúmenes, es evidente que el rumen B, alimentado con leche y granos, es el que tuvo un mayor crecimiento papilar y desarrollo ruminal. Una pequeña cantidad de granos y agua genera fermentación. La fermentación produce ácido butírico (un ácido graso volátil) en el rumen. Esto desarrolla un rumen más funcional que podrá



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digerir mejor los granos y los forrajes más adelante.

3 Ingesta inicial

Un ternero debe consumir cuatro partes de agua por cada parte de granos que consuma. Al limitar la ingesta de agua, también se limita la ingesta de granos. El agua activa la fermentación microbiana en el rumen, lo que produce ácidos grasos volátiles (AGV) que generan el desarrollo de las papilas. Estas mismas papilas luego absorben los ácidos grasos volátiles, que brindan nutrición al rumen y preparan al ternero para una transición sin problemas al posdestete.

4 Posdestete

Lo ideal es que nuestros terneros hagan la transición de la leche a los alimentos sólidos sin que esto afecte su salud ni las tasas de crecimiento. Algo a lo que nos podemos enfrentar luego del destete de los terneros es el síndrome de estrés posdestete (PWSS, por sus siglas en inglés). Un ternero que sufre de síndrome de estrés posdestete pierde peso y con frecuencia se enferma debido a que no tiene bien desarrollado el rumen. Este rumen poco desarrollado limita la ingesta de alimentos y puede limitar el crecimiento.

En conclusión, un ternero solo puede absorber nutrientes del rumen en proporción a la cantidad de papilas. Cuantas más papilas tengan, las vaquillonas podrán absorber más ácidos grasos volátiles provenientes de la fermentación en el rumen. Ofrecer agua desde el nacimiento promueve la buena salud de los terneros y los prepara para tener una buena producción en el corto y largo plazo. 🐄

 **PROGRESSIVE
DAIRY**

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Calves and water: Why offering water from day one is essential for proper health and development

Jennifer Trout for *Progressive Dairy*

AT A GLANCE

Taking advantage of water, the most essential nutrient, and offering it to calves from birth sets your herd's health and production up for both short- and long-term success.

This is not another article about how important fresh, clean water is for calves. Instead, this article focuses on why feeding water from day one is so vital. The “why” is rumen development and the long-term benefits for animal health and productivity.

Why wait?

Despite being an animal welfare recommendation, most calves do not receive water from the first day of life. In fact, according to the most recent National Animal Health Monitoring System survey, the average age when calves were first offered water was 17 days (Table 1, back page).

A reason for this long wait time may be due to the belief that calves receive all the water they need from their milk or milk replacer. While milk and milk replacer are around 87% water, virtually none of it enters the calf's rumen. When calves drink milk, whether from a bottle or bucket, a reflexive response is initiated that shunts milk via the esophageal groove past the rumen to the abomasum. This bypass mechanism persists in the calf until approximately 12 weeks of age.

When a calf drinks water, it is either doing so out of thirst or curiosity. There is no nervous stimulation or excitement triggering the esophageal groove, and water enters the rumen, where it is an essential ingredient for rumen development. In the rumen, water acts as a substrate for microbial growth (along with bacteria and feed particles the calf has ingested) that kickstarts fermentation and rumen development.

So what happens when you wait? Studies have shown a calf's rumen development is slowed when you wait to give it water. In the long term, your herd may be affected by what I like to call post-weaning slump syndrome (PWSS), poor growth rates and, ultimately, lower milk production.



Photo courtesy of Cargill.

Optimum fermentation occurs at a 4:1 ratio, meaning a calf should consume four parts water to each one part starter consumed. By limiting water intake, you are also limiting a calf's starter intake. Water enables microbial fermentation in the rumen, producing VFAs that result in papillae development.

When you don't wait to provide water, other studies have shown increased bodyweight gains and improved starter intake. Long term, the rumen will be more developed with increased fermentative ability for enhanced health, growth and production.

Water is essential

Water is the most important component of any animal's body. For a calf, water equals over 50% of its total body composition (80% at birth). Furthermore, water is required in the greatest amount of all nutrients and serves a host of metabolic functions (digestion, reproduction, thermoregulation, etc.).

Since water is essential for digestion and nutrient absorption, it should be offered free choice, beginning day one when calves are moved to hutches or other housing. Beyond cellular functions, water is fundamental for the development of the rumen, initiating starter intake and setting the calf up for post-weaning success.

Rumen development

Within a few days of birth, the calf's rumen will start developing a population of microbes. These new rumen microbes need water, feed particles and bacteria to grow properly and ferment feedstuffs. Just like water, feeds have the same effect on the esophageal groove. Feed is able to enter the rumen, where it must be digested by microbes or broken down further by rumination.

Continued on back

Tips for offering water

- 1 Offer it on day one.
- 2 Use a shallower pail for grain and water for the first one to two weeks to train calves where feed and water are.
- 3 Use light-colored pails; from my farm visits I have seen calves show a preference toward light over dark-colored pails.
- 4 Place a divider between water and feed buckets or space them far enough apart to prevent calves from carrying feed over to the water pail and vice versa.
- 5 Review water delivery times weekly. Check in with employees to see that milk, water and grain feeding are on schedule.
- 6 Provide clean water daily in clean buckets and as often as needed.

TABLE 1 Average age when calves were first offered water

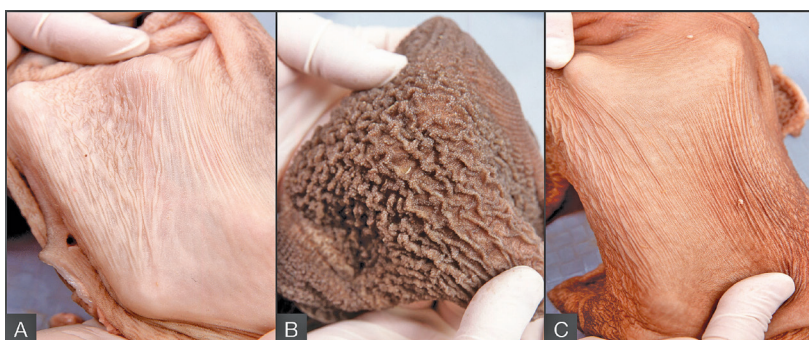
Diet	Very small (fewer than 30)		Small (30-99)		Medium (100-499)		Large (500 or more)		All operations	
	Avg.	Std. error	Avg.	Std. error	Avg.	Std. error	Avg.	Std. error	Avg.	Std. error
Water	15.3	(2.5)	20.0	(1.1)	15.4	(1.1)	7.8	(1.0)	17.3	(0.7)

Operation average age (d)

Herd size (number of cows)

Source: National Animal Health Monitoring System survey

FIGURE 1 Rumen papillae development at six weeks in calves fed milk only (A), milk and grain (B), or milk and hay (C)



Source: Penn State University.

Calves and water, cont'd from front

Rumen development is also affected by the calf's exploration of its environment. Particles consumed while exploring inoculate the rumen with bacteria. The rumen microbes that survive are those that best digest and utilize feeds eaten by the calf. Water in the rumen provides the media for microbes to live. This mix of water and microbes in the rumen enables fermentation of carbohydrates leading to volatile fatty acid (VFA) production and rumen papillae growth. Optimal fermentation occurs when approximately four times as much water to dry feed is available in the rumen.

I like to look at it like you are feeding two calves, the current monogastric one and the future ruminant. The monogastric calf receives its primary digestive function and nutrient absorption from the abomasum. The ruminant calf uses water, calf starter and environmental bacteria to grow itself and develop papillae for fermentation. A calf's abomasum digests milk and those nutrients needed for growth and weight gain now. Simultaneously, water and grain fed to calves is digested in the rumen and is setting the calf up for continued growth and weight gain in the future.

Penn State University shares this comparison (**Figure 1**) of rumen papillae development at six weeks in calves fed milk

only (A), milk and grain (B) or milk and hay (C). It's evident from the three rumens provided that rumen B, fed both milk and grain, had the greatest papillae growth and rumen development. The bottom line is that a small amount of grain, along with water, will create fermentation and, therefore, butyric acid production in the rumen. This, in turn, enhances the development of a more functional rumen that can better digest grains and, later in life, forages.

Starter intake

Studies have shown that dry matter intake is directly related to water intake. Over 30 years ago, researchers showed the benefits of providing free choice water to neonatal calves. Results of the study indicated providing free choice water increased starter intakes by 31% and weight gains by 38% over calves deprived of water. We know that weight gain during the first two months of life (specifically skeletal and muscle growth) is positively correlated to first-lactation milk yield.

Recall that optimum fermentation occurs at a 4-to-1 ratio, meaning a calf should consume four parts water to each one part starter consumed. By limiting water intake, you are also limiting a calf's starter intake. Water enables microbial fermentation in the rumen, producing VFAs that result in papillae



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development. These same papillae then absorb VFAs, which provides nutrition to the rumen and prepares the calf for a smooth post-weaning transition.

Post-weaning

Ideally, we want to transition our calves from milk to solid feeds without skipping a beat in health and growth rates. Something many producers face after transitioning calves off milk is PWSS. A PWSS calf drops in bodyweight and often experiences illness due to an underdeveloped rumen. This poorly developed rumen limits dry matter intake, resulting in an inefficient heifer.

In 2018, Iowa State researched the post-weaning benefits of free choice water on 30 calves. Calves were separated into two groups: calves offered water from birth and calves offered water from 17 days on. When following up at five months of age, calves offered water from birth had higher bodyweights than calves offered water from day 17 on (198 kilograms versus 187 kilograms). Their findings concluded that supplying drinking water immediately after birth could improve growth and development of calves pre-weaning and post-weaning, potentially by stimulating rumen development, thus increasing nutrient availability.

A calf can only absorb nutrients from her rumen in proportion to the surface area of the rumen lining. That surface area depends heavily on the growth of papillae – resulting in a greater surface area available for nutrient absorption. With more papillae, heifers have a greater absorptive capacity for the VFAs fermented in the rumen. Providing water from birth sets your herd's health and production up for success in both the short and the long term. 🐄

References omitted but are available upon request.

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