

Selecting a Round-Bale Feeder

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Round-bales are used throughout the horse industry as a means of providing forage to horses housed in poor pastures, dry lots, or during winter months. Many horse owners find round-bales convenient, less labor intensive, and more affordable than other hay types, but report an inability to control horse weight gain and excessive hay waste. Several types of round-bale feeders exist, however, little research has been done to characterize hay waste resulting from different round-bale feeders when fed to horses. Researchers at the University of Minnesota set out to compare hay waste, hay intake, and economics of nine round-bale feeders and a no-feeder control when used during horse feeding. The nine round-bale feeders tested: Cinch Net, Cone, Covered Cradle, Hayhut, Hay Sleigh, Ring, Tombstone, Tombstone Saver, and Waste Less.

In June, 2010, 50 round-bales were baled from a pure stand of orchardgrass. Round-bales were stored until fed and, prior to storage, each round-bale was individually weighed and analyzed. Each feeder was placed on the ground in a dirt paddock. Each feeder was evaluated for 20 consecutive days with a total of 25 horses. Groups of five adult horses, Quarter Horse and Thoroughbred geldings and open mares, were fed hay in each feeder over a four day period. Every fourth day, groups of horses were rotated among paddocks, weighed, and a new round bale was placed in each feeder. Hay on the ground surrounding the feeder was collected daily, dried, and weighed. The total amount of hay removed around each feeder for a four day period was considered waste. DM intake was estimated as the difference between hay disappearance and waste. Number of months for the reduction in waste to repay feeder cost (payback) was calculated using hay valued at \$100 per ton, and improved feeder efficiency over the control. The Covered Cradle had collapsible side feeding panels that rested on the bale and compressed down as the bale was eaten. The Waste Less feeder also had collapsible side feeding panels, but panels were lowered

by hand every day at 9:00 a.m. and 9:00 p.m. to ensure horses had constant access to hay in the feeder.

No injuries were observed from any feeder types during the data collection period. However, cosmetic rub marks along the sides of faces were observed on many horses feeding out of the Waste Less. Experiments utilizing different age groups of horses, and for longer durations, would help to further examine the safety of each feeder. After two days of feeding off the Cinch Net, the round bale collapsed down and horses were able to stand and defecate on the remaining hay. Thus, the recommendation is the Cinch Net be used in combination with another feeder to

Figure. Round-bale feeder designs: a. Cinch Net, b. Cone, c. Covered Cradle, d. Hayhut, e. Hay Sleigh, f. Ring, g. Tombstone, h. Tombstone Saver, and i. Waste Less



eliminate horse access as the round-bale collapses during feeding. The manufacturer also recommends horses should not be shod when feeding from the Cinch Net.

The orchardgrass hay met or exceeded the horses' nutritional requirements for digestible energy (DE), crude protein (CP), calcium (Ca), and phosphorous (P) for non-working mature horses. Feeder design did not affect hay intake; all feeders resulted in an estimated hay intake of 2.0-2.4% body weight (BW). However, the no-feeder control resulted in a reduced intake of 1.3% BW. Pen weight change was not different among feeder types. However, when compared to the no-feeder control, six of nine feeders resulted in small pen weight gains including the Cinch Net, Cone, Covered Cradle, Hay Sleigh, Tombstone, and Waste Less feeders. The no-feeder control resulted in greater pen weight loss than six of the feeders, but was not different from Hayhut, Ring, or Tombstone Saver. At 1.3% BW of estimated hay intake, DE requirements were not met with the no-feeder control, accounting for the pen weight loss, although, CP, Ca, and P requirements were met.

Mean percent hay waste differed among feeders: Waste Less, 5%; Cinch Net, 6%; Hayhut, 9%; Covered Cradle, 11%; Tombstone Saver, 13%; Tombstone, Cone, and Ring, 19%; Hay Sleigh, 33%; and no-feeder control, 57%. Feeder design also affected payback. The Cinch Net paid for itself in less than 1

month; Tombstone and Ring, 2 months; Hayhut and Tombstone Saver, 4 months; Hay Sleigh, 5 months; Waste Less, 8 months; Cone, 9 months; and Covered Cradle, 20 months. As hay increases to \$200 per ton, months to payback the feeder costs are cut in half. Although the Cinch Net paid for itself in the shortest amount of time, the net material is guaranteed to last for 3 years, while all other feeders claim to last indefinitely. However, feeder longevity was not measured nor accounted for in the payback.

Round-bale feeder design affected hay waste and economics, but not safety, intake, or herd weight change during horse feeding. Use of a round-bale feeder, regardless of design, is necessary to avoid 57% waste, reduced intake, and horse weight loss. Excessive hay waste observed with the no-feeder control will likely contribute to insect breeding areas, mud, and additional manure removal costs. Economics were impacted by waste efficiency and feeder purchase price, however, all feeders repaid their cost within 20 months with hay valued at \$100/ton. This information is useful when purchasing round-bale feeders and estimating hay needs.

Within a column, means without a common superscript letter are statistically different.

Table. Hay waste, hay intake, herd weight change, and payback of round-bale feeders and a no-feeder control.

Feeder Type	Hay Waste (%)	Hay Intake (%BW)	Herd Weight Change (lbs)	Payback (\$100/ton hay) (months)	Payback (\$200/ton hay) (months)
Waste Less	5 ^a	2.3 ^a	70 ^a	8 ^e	4 ^e
Cinch Net	6 ^{ab}	2.4 ^a	183 ^a	0.8 ^a	0.4 ^a
Hayhut	9 ^{bc}	2.3 ^a	-7 ^{ab}	4 ^c	2 ^c
Covered Cradle	11 ^c	2.4 ^a	55 ^a	20 ^f	10 ^f
Tombstone Saver	13 ^{cd}	2.2 ^a	-35 ^{ab}	4 ^{cd}	2 ^{cd}
Cone	19 ^d	2.1 ^a	57 ^a	9 ^e	4.5 ^e
Tombstone	19 ^d	2.2 ^a	174 ^a	2 ^b	1 ^b
Ring	19 ^d	2.1 ^a	0 ^{ab}	2 ^b	1 ^b
Hay Sleigh	33 ^e	2.0 ^a	37 ^a	5 ^d	2.5 ^d
No-Feeder	57 ^f	1.3 ^b	-225 ^b	--	--

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The research was recently published in the Journal of Animal Science
<http://jas.fass.org/cgi/content/abstract/jas.2011-4087v1>.

Manufactures and Feeder Websites:

Cinch Net (Cinch Chix LLC, North Branch, MN)

<http://www.cinchchix.com/about-the-cinch-products.html>

Cone (Weldy Enterprises, Wakarusa, IN; model R7C)

<http://weldyenterprises.com/wm.html>

Covered Cradle (SM Iron Inc., Sanborn, MN)

www.smironsales.com/page/page/870741.htm

Hayhut (Hayhuts LLS, Deleon Spring, FL)

www.hayhuts.com

Hay Sleigh (Smith Iron Works Inc., St. Francis, MN)

<http://smithironworksmn.com/feeders.html>

Ring (R & C Livestock, Bethany, MO) (no website available)

Tombstone (Dura-Built, Eagan, MN)

www.fleetfarm.com/catalog/product_detail/horse-supplies/barn-stable-supplies/watering-feeding-equipment/dura-built-round-bale-horse-feeder

Tombstone Saver (HiQual, Victoria, British Columbia, Canada)

www.gateway-ranch-ponies.com/gatewayr_files/hiqualfeeders.htm

Waste Less (JSI Innovations LLC, St. Croix Falls, WI)

www.teamjsi.com/578.html