Comparing Self-feeding to TMR Bunk-feeding

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Outline

- Purpose
- University research
  - Comparison of fenceline TMR to self-feeder
  - Angus steers on self-feeder
  - Comparisons across three trials
- Self-feeding and yardage expense
- Recommendations
- Improvements to self-feeding method?

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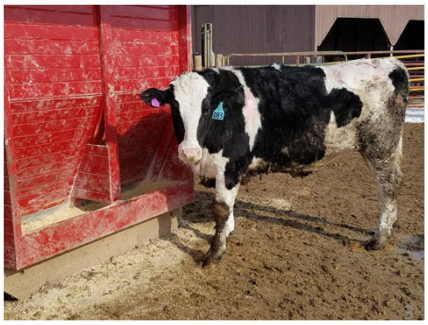
Purpose

- Are self feeders less efficient than slick bunk management?
- Public research was absent
- Finishing by Self-feeding vs TMR in Bunk

"Steer Stuffer"



Comparison of Fenceline TMR to Self-feeder

- Steers used in Holstein comparisons
  - Holstein steers after grazing season during which ADG was 1.25-1.8 lb/d
  - Average start wt ~850 lb
- Utilized performance from two trials conducted at same time at Arlington to compare
  - Finishing Trial 1 – self-feeder
  - Finishing Trial 2 – fenceline-fed TMR

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Self-feeder Treatment

- 75 steers
- Adapted to bunk-fed 15% corn silage diet
- Switched to self-feeder diet fed in bunks
- Dewormed, Clostridial 7-way, Revalor-XS on d 1
- Put in barn lot with 3 pens, each with self-feeder
- Harvested on d 167 at JBS Packerland

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Self-feeding

- No forage provided
- One Apache self-feeder per pen
  - 3.5 ton, filled 1-2X weekly
  - 7.4 in./hd; trough 10 in. wide x 10 in. deep
  - 68 sq. ft./hd; bedded pack at 4 d intervals with oat hulls, sawdust or corn stalks; scraped open lot weekly

Self-fed Diet

Ingredient	% DM	As fed cost
Corn, whole & cracked	64.1	$3.15/bu
Corn gluten feed	17.6	$180/ton
Wheat & Oats	7.5	$165/ton
Distillers grain	6.4	$160/ton
Supplement	4.5	$500/ton
	$/ton DM	**$171.16/ton**
Nutritional attribute		
Crude protein, %	13.3	
aNDF, %	18.5	
Non-fiber carbohydrate, %	58.6	
NEgain, Mcal/lb	0.64	

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TMR Bunk Treatment

- 72 steers
- Adapted to 12% corn silage diet by d -4
- Clostridial 7-way and dewormed on d 0
- Implanted with Revalor-IS on d 1
- Bunks read at 7 AM; fed at 8 AM; sawdust bedding
- Two heaviest blocks harvested on d 139; remaining 3 blocks on d 167 at JBS Packerland

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TMR Bunk-fed Diet

Ingredient	% DM	As fed price
Corn silage	12	$33.00/ton
Corn, cracked	76.1	$118/ton
Distillers grain	6.8	$160/ton
Urea	1.0	$631/ton
Supplement	4.1	$500/ton
	$/ton DM	**$154.68/ton**
Nutritional attribute		
Crude protein, %	12.5	
aNDF, %	13.7	
Non-fiber carbohydrate, %	64.4	
NEgain, Mcal/lb	0.69	

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Trial 3 Methods

- Objective: determine feed conversion efficiency for native steers via self-feeding
- 72 Angus steers, single herd source
- Adapted to 15% corn silage finishing diet
- On d 29, implanted with Revalor-S and hauled to barn lot with Apache self-feeders
- Corn stalk bedding at 4 d intervals
- On d 132, hauled 180 mi for harvest at Tyson, Joslin, IL

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Angus Self-fed Diet

Ingredient	DM basis	As fed price
Corn, whole and cracked	37.6	$3.30/bu
Corn gluten feed	15.1	$180/ton
Wheat midds	29.8	$100/ton
Oats	9.9	$187/ton
Tallow	2.2	$1,380/ton
Molasses	2.0	$460/ton
Supplement	3.8	$500/ton
	Cost/ton DM	**$190.41/ton**
Nutritional attribute		
Crude protein, %	13.4	
aNDF, %	23.8	
Non-fiber carbohydrate, %	50.9	
NEgain, Mcal/lb	0.62	

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Comparison across Trials 1-3

Variable	Trial 1	Trial 2	Trial 3
Breed	Holstein	Holstein	Angus
Feeding method	Self-feeder	TMR Fenceline	Self-feeder
Initial BW, lb	793	847	810
Implant	Revalor-XS	Revalor-IS	Revalor-S
Final BW, lb	1441 a	1457 a	1315
DMI, lb/hd*d	24.7 a	25.4 b	26.4
ADG, lb/hd*d	**3.86 a**	**3.92 a**	**3.83**
DMI/ADG (DM feed:gain)	**6.65 a**	**6.50 a**	**6.89**

a,b Means with different letter are different (P< 0.01)

Feed efficiency by self-feeding is as good as TMR fenceline feeding.

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Comparison across Trials 1-3

Variable	Trial 1	Trial 2	Trial 3
Breed	Holstein	Holstein	Angus
Feeding method	Self-feeder	TMR Fenceline	Self-feeder
Implant	Revalor-XS	Revalor-IS	Revalor-S
Dress, %	60.1	58.0	61.7
Hot carcass, lb	867	852	811
Rib-eye area, sq. in.	11.9	11.5	13.0
Fat thickness, in.	0.31	0.28	0.57
Yield grade	3.3	3.3	3.2
Marbling	Modest-28	Modest-46	Small-83
Empty body fat, %	29.1	28.9	30.8

Empty body fat: Holstein Self-fed = Holstein TMR fenceline
Suggests feed efficiency comparison is valid.

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Comparison across Trials 1-3

Variable	Trial 1	Trial 2	Trial 3
Breed	Holstein	Holstein	Angus
Feeding method	Self-feeder	TMR Fenceline	Self-feeder
Diet NEgain, Mcal/lb	0.64	0.69*	0.62
aNDF, %	18.5	13	23.8
Non-fiber carbohydrate, %	58.6	65.5	50.9
Starch, %	47.5	68*	-

*suspect analysis error and diet likely NEgain 0.66 Mcal/lb

NDF ranking: Angus Self-fed > Holstein Self-fed > Holstein TMR fenceline, assuming no other forage/roughage is fed.

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Holstein Steer Budget Comparisons

- Prices for budgets
  - Feeders - 8 wts @ $75/ cwt;
  - Choice Feds - $90/ cwt
  - Bedding - 5 lb/ head per day at $35/ ton
  - Yardage –
    - $0.60/ head/day TMR,
    - $0.54/head/day self fed
  - Days on Feed
    - Self Feeder 167 d
    - TMR 155 d - weighted ave

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Holstein Budget Comparisons

Program	Self Feeder	TMR Bunk
Income	$1297	$1311
Purchase	$620	$662
Total feed	$351	$287
Other costs*	$120	$120
Yardage**	$90.18	$93.00
Cost/ lb gain	$0.90	$0.86
Return to labor & mgt	$116	$149

*Other costs include death loss, interest on feed and cattle, veterinary, bedding, health products, implants, transportation, and marketing
** Does not include any labor and management.

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Self-feeding and Yardage Expense

Cost	Fenceline Bunk	Self-feeder	Effect due to Self-feeding
Tractor	Feeding, bedding, manure hauling	Bedding, manure hauling	Small change
Equipment	J-bunks, TMR wagon, silage handling	Feed mixing, Self-feeder w 10-yr life	Small change
Labor	Daily feeding, pen checks, bedding, manure hauling	Pen checks, bedding, manure hauling	Small change
Yardage	$0.60/hd*d	$0.54/hd*d	10% savings

https://fyi.extension.wisc.edu/wbic/files/2015/08/UW-Extension-Holstein-Steer-Finishing-Yardage-summary-final.pdf

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Feeding Method Considerations

- Trials showed we can get the same performance between self feeders and TMR bunk feeding management programs.
- TMR feed costs were lower because of lower cost feed ingredient options
- Need to calculate your own costs to find out what will work best for you.

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Feeding Method Considerations

- Self feeder can use whole corn and pellet or a diet made up of grain and co-products along with supplement to balance
  - We recommend 18% NDF in self feeder diets using rolled ingredients for “scratch factor”
- Can be mixed on farm or by feed mill and delivered
  - Evaluate costs for your operation
- Self feeder must use dry feeds, which limits feed option flexibility and possible cost savings.
- Small numbers of cattle on feed may not be able to keep up with ensiled feeds
- Grinding hay into self feeder diets can be troublesome

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Feeding Method Considerations

The following situations can be dealt with by good management

- Self feeder program may encourage “continuous flow” pens, where some finished cattle leave so lightweight feeders are added.
  - Does not allow accurate closeouts to be calculated
  - Causes disruption in “social order” in the pen - increased risk of injury and bruising
  - Can be better than all-in all-out regarding sale of excessively and under-finished animals
- Self feeders may be the best fit for small sized cattle feeders

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Feeding Method Considerations

- If you feed hay/forage free choice in the pen with self feeders:
  - Pay attention to consumption
  - Too much slows performance
- Limit feeding hay/forage helps you be in charge of what they eat.
  - Adequate feed access space so all cattle can get to the hay when it is fed.

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Feeding Method Considerations

- Slick bunk (crumbs) TMR feeding assists with pen checks when feeding
  - All animals should get up and go to the bunk to eat when feed is delivered.
- Fenceline bunk feeding may encourage:
  - feeding too high of a roughage diet, too little energy, too much silage
  - using steers as a "garbage disposal"
    - feeding only poor quality feeds just to get rid of them and not balancing a ration
- If you really don't want to manage a bunk, self feeder might be the better option

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Finishing by Self-feeding Recommendations

- Keep feed in front of cattle at all times.
- Dry, draft-free housing to minimize respiratory disease. Bedding and ventilation are important no matter which feeding option you use.
- Correctly managed diet fed via self-feeder or bunk does not affect feed efficiency.

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Can the Self-feeding Method be Improved?

- Optimization of pen space allotment
- Optimization of starch digestibility
  - Particle size and rate of passage
- Optimization of diet NDF and NFC
- Diet adaptation strategy
- Intervention for wood-chewing
- Bedding consumption
- Optaflexx inclusion

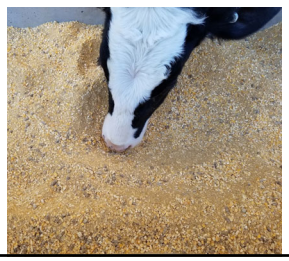
Diets Self-fed (as-fed basis)

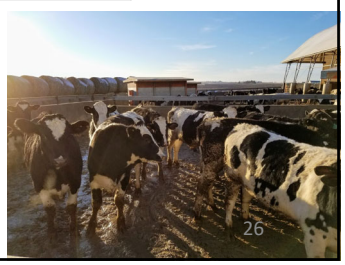
Ingredient	Diet 1	Diet 2
Corn, cracked, %	67	65
Corn gluten feed, pelleted %	12	-
Distillers grain, %	15	30
Balancer pellets, %	6	5

No inclusion of Tylan, Optaflexx, molasses, probiotics or other non-nutritional additives. No forage/roughage provided, except corn stalk bedding.

Summary across 25 closeouts

Variable	Overall Ave
Head, Ave	346 (n=25)
Initial wt, lb	487
Harvest wt, lb	1437
Duration, d	321
DMI, lb/hd*d	**20.5**
ADG, lb/hd*d	**2.95**
DMI/ADG	**6.97**
Grade	**80+% choice & prime**





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