

National FFA Convention – Housing and Facilities Scenario October 2014

Scenario: You received a call from Fred F. Anderson, owner of FFA Dairy, LLC. Mr. Anderson has some concerns with the housing and facilities on his dairy operation. He feels that there may be some room for improvements, and would like to know what suggestions and recommendations you have to either change or improve the milking herd's facilities to better manage the cows within the current housing and facilities on the dairy.

FFA Dairy, LLC is currently milking 1300 Holstein and 225 Jersey dairy cows, 3 times per day, on a free stall dairy operation in the Midwestern US. The farm has a rolling herd average (combination of Holstein and Jerseys) of 23,250 lbs of milk, and they typically average 4.1% milk fat and 3.2% protein. The farm has a great relationship with their nutritionist and do not currently have any concerns with the nutritional content, mixing, or feeding of the diet.

The dairy originally started as a 100-cow operation in the 1970's and has gone through numerous expansions over the years. Their latest expansion added a new 4-row free stall barn that houses approximately 900 cows. The 225 Jerseys are all being housed in the 4-row free stall barn that has deep-bedded sand stalls. The older free stall barn that is still being used for housing is a 6-row free stall barn. The 6-row free stall barn was originally designed with mattresses. The mattresses were recently replaced and dual-chamber waterbeds were installed. The waterbeds are bedded with a nice layer of sawdust and there is no presence of sores or missing hair on the hocks of the cows. All of the dry cows are housed in a dry cow barn close to the lactating cow facilities. After calving, the dry cows are brought over to the lactating cow facility to be milked and are placed in Pen D (Figure 1).

The cows are currently milked 3 times a day in a double-25 parallel, rapid exit milking parlor (Figure 2). There is a large holding pen with a crowd gate. Most of the cows within each pen are milked separately from other groups. However, the employees do bring up pens L and M at the same time since they are all late lactation cows and they want to save time moving cows. For the late lactation cows, the first 4.5 turns of the parlor are placed back in pen L and the remainder in pen M at each milking.

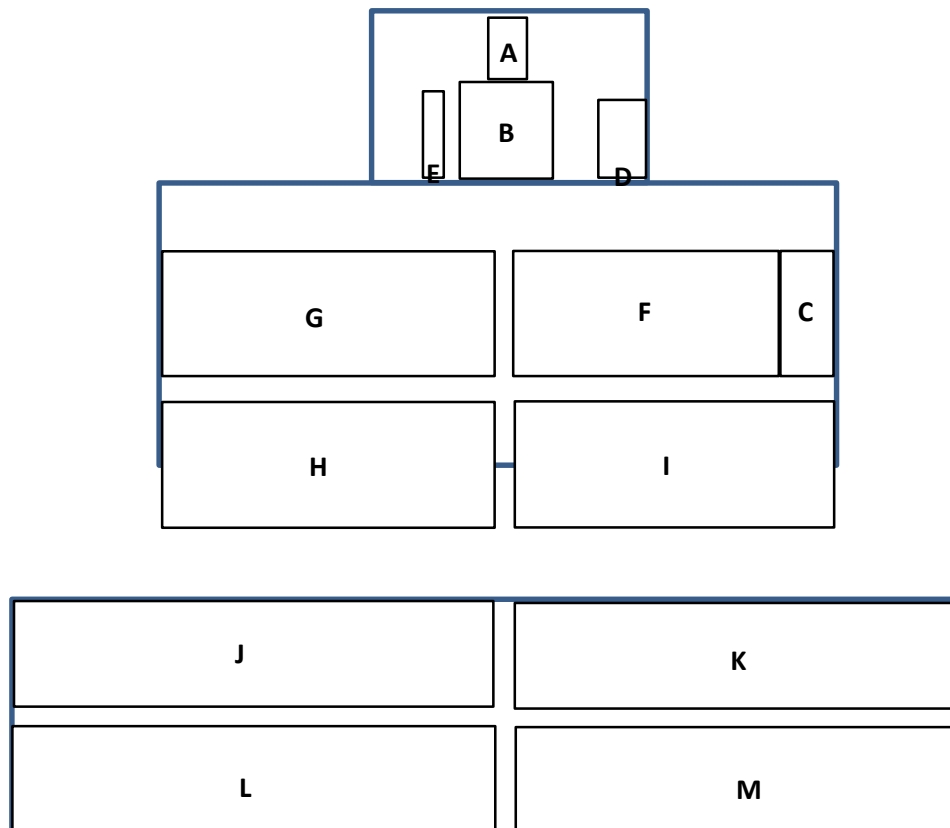
During the summer months, Mr. Anderson typically sees a decline in milk production and in conception rates. Fans are installed in both of the free stall barns only, and no additional cooling strategies are in place.

In addition to an overall evaluation of his housing and facilities, Mr. Anderson has a few specific questions for you:

- Since milk prices have been above average, Mr. Anderson is willing to invest \$25,000 into these facilities. What changes would you suggest that would have the greatest impact on milk production, reproduction, health, and well-being of the cows in these facilities? Please (1) prioritize your suggestions and (2) explain why you are recommending them.

- Right now, all of the free stall barns at FFA Dairy, LLC have feed rails. Explain to Mr. Anderson what the advantages and disadvantages of headlocks are as compared to feed rails.
- Looking at the future plans for the dairy operation, Mr. Anderson feels that their current site and land base could support a milking herd of 2200 cows. He would like to expand his parallel milking parlor to be able to milk all of the cows 3 times per day. How large of a milking parlor would he need to build?

Figure 1. General layout of lactating cow facilities and cow groups at FFA Dairy, LLC.



- A – Milking parlor – Double 25 parallel, rapid exit parlor
- B – Holding pen
- C – Vet room and storage area
- D – Hospital and cows that have just calved (~20 cows in this pen at a time)
- E – Palpation rail
- F – Fresh cows (115 cows)
- G – Lactating cows – 2 year olds, high producing group (170 cows)
- H – Lactating cows – 2 year olds, low producing group (170 cows)
- I – Lactating cows – high group (170 cows)
- J – Lactating Jerseys –2 year olds and mature cows (225 cows)
- K – Lactating cows – breeding group (225 cows)

L – Lactating cows – bred, late-lactation cows (225 cows)

M – Lactating cows – bred, late-lactation cows (225 cows)

Table 1. Barn information and stall measurements.

6 row free stall barn	4 row free stall barn
Fresh cow pen (F): 190 ft of bunk space 135 stalls Other pens (G, H, I): 150 stalls per pen 210 feet of bunk space per pen 2 water troughs per pen (2 ft by 10 ft each) Stall dimensions Width: 44 inch Stall length (head-to-head): 7 ft Stall length (to wall): 8 ft Neck rail height: 46 inches No brisket boards	All pens (J, K, L, M): 175 stalls per pen 386 feet of bunk space per pen 3 water troughs per pen (2 ft by 12 ft each) Stall dimensions Width: 48 inch Stall length (head-to-head): 8 ft Neck rail height: 48 inches No brisket boards

Table 2. Suggested dimensions for open and closed front free stalls for mature dairy cattle (Graves et al., 2009).

Animal Weight (lbs)	Total stall length Closed front (in)	Total stall length Open front (in)	Length to brisket tube or board (in)	Length to neck rail (in)	Stall width center to center (in)	Height to neck rail (in)
900 - 1100	90 - 96	78 - 82	64 - 66	62 - 64	41 - 43	42 - 44
1100 - 1300	96 - 102	80 - 86	66 - 68	64 - 66	43 - 45	44 - 46
1300 - 1500	102 - 108	90 - 96	68 - 70	66 - 68	45 - 48	46 - 48
1500 - 1700	108 - 114	96 - 102	70 - 72	68 - 70	48 - 52	48 - 52

Figure 2. Pictures of the double-25 rapid exit, parallel milking parlor.



Figure 3. Pictures of cows in the 6-row free stall barn.



Figure 4. Cows in the 6-row free stall barn.



Figure 5. Sand-bedded free stalls in the 4-row free stall barn.

