Time for Technology

What you've told us about pushing feed, and implications for automation.

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Members of the Progressive Dairy Operators group have recently participated in a survey of labour costs and feeding management practices which yielded some interesting information. The results are being subjected to a thorough analysis by OMAFRA dairy specialist Brian Lang, and you can expect to see more information about this data in future articles by both Brian and myself. A total of 115 herds ranging in size from 40 to over 1000 cows provided data on the cost of hired labour, and also on the time required to complete various feeding related tasks. This kind of data can be very useful in calculating the cost of doing various chores on the farm, and that in turn can be useful in determining the cost benefit of automating these tasks. In this article I will try to use this data to take a very specific and detailed look at the economics of pushing up feed with an automatic pusher. There are two types of feed pushers available in the market place today. A hydraulic plough designed for use in a center drive through has been on the market for about 10 years. While it works well, it has not come into widespread use, perhaps because it is very difficult to overcome the conflict between this device and the manure covered, roughened concrete feed alley crossover commonly located in the center of many freestall barns. The track and plough may also interfere a little with TMR feed delivery, and manger cleanup. I have also seen on farm designs involving cable drive manure scrapers on which one of the ploughs runs over the feed alley and pushes up feed. More recently Lely has introduced the Juno, a battery operated wheel mounted robotic unit with a rotating blade that can be programmed to push feed along any pre-programmed route with any frequency. Two of the survey farms have this equipment and reported pushing up feed with it 11 times per day on one farm and 18 times on the other. Although more costly this unit is more flexible because it can push feed in any variety of places and directions. It can push it further in when there is less feed and if you can find a convenient spot for the charging unit, there is no conflict with the cross over or with feed delivery and daily clean up.

The recently completed survey provides several pieces of information about pushing up feed that are very helpful in assessing the cost benefit of automating this chore. On the 115 farms reporting, average wages paid to non family help were $14.31 per hour, which included non monetary benefits valued by the farmer at $0.45 per hour. Eight of the farms reported that they did not push up feed, and some of these went on to explain that they had narrow feed

bunks accessible from both sides, where push up was not required. This type of bunker design provides an alternative to pushing up feed, but when we examine the data in more detail it will be interesting to see how much more time these herds spend cleaning up left over feed.

The 105 herds that did use labour to push up feed used a skid steer (43), tractor (14), lawn tractor (13) or 4 wheeler (6) and 27 did the job by hand with only a shovel, broom or scraper. The number of times they pushed up ranged from 1 to 10 and averaged 4.27 times per day. The time taken to push up feed also varied quite widely and averaged 6.07 minutes per push up event. Using these numbers the average herd in the survey spends 26 minutes per day, or 158 hours per year pushing up feed. If the paid hired help is doing this job at $14.31 per hour the annual cost is $2256. The suggested price for the robotic feed pusher is $24,675. Many dairy producers will look at this price tag, and at the machine itself, and then remark that they can buy a small car for that amount of money and they would never consider such a price tag for a feed pusher. But at the end of the day, neither the total value of the parts, nor the research and development costs will determine where such equipment is priced. In reality the price is likely a best guess of what the manufacturer thinks you will pay for it, and that will reflect the value of what it does for you.

In this case every farmer will have his own idea of how quickly capital investments have to pay back, but at 5% interest amortized over 15 years it costs $95 per year to repay $1000 of borrowed money. If this is a reasonable rate of repayment for this equipment, and nothing else changes it looks like the average survey farm would be about $100 per year short on covering the cost of ownership from the labour saved.

But other things will change as well. There will be some maintenance on the new equipment and some electricity required to run it, but since the skid steer will now only be used once per day for clean up, it will require less maintenance and fuel. There will also be extra benefits from pushing up feed more frequently. The two herds in the survey that already have this equipment were pushing 11 and 18 times, indicating there are no real time constraints involved.

Perhaps one of the most surprising outcomes of the survey was when farmers reported feeding and pushing feed. Although expressing this observation numerically is difficult, the majority of herds reported feeding once per day, and in nearly all herds, the feed was delivered between 5 a.m. and 11:00 a.m. The herds that fed twice a day usually added a second feeding late in the afternoon. Hence in both once and twice daily fed herds the bunk will be emptiest and most in need for push up near the end of the longest interval between feeding.....and that period is between midnight and 5 a.m. which corresponds perfectly to the time when no one pushed up feed! Unless a feed pusher is in the cards, dairy producers may want to rethink feeding times so that they can be in the barn and available to push feed at the tail end of the feeding period.

There are no reliable numbers on how much more feed intake and how many more meals we should expect when feed is pushed up more often, but most nutritionists would predict higher feed intake from more meals per day, and that should increase milk production, decrease feed costs per litre, and decrease the incidence of rumen acidosis and associated health problems. In robot herds we may also stimulate more frequent milking visits. Lastly 17% of the survey farms acknowledged that the equipment used for pushing feed occasionally had manure on the tires and when it comes to biosecurity manure and feed are definitely a bad combination.

At the end of the day, whether or not a technology will pay in a given situation will be highly variable from farm to farm, depending on the cost, time required and relative costs and benefits of doing it another way. But perhaps the quick calculation done here can serve to demonstrate that when it comes to feed pushers, the potential for payback seems to be substantial on many typical dairy farms.

Hydraulic feed pushers have not been widely adopted, partly because the track and plough can interfere with crossovers and with feed delivery.

The Juno feed pusher can be programmed to travel a variety of routes, at varied distances from the manger wall depending on the time of day.