

HOW TO MAKE ID TECHNOLOGY WORK FOR YOU

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Introduction

Technology is defined by Webster as “The discipline dealing with the art or science of applying scientific knowledge to practical problems”. Because of the lack of standardization, variables in facility, feed stuffs available, management philosophy, and overall leverage in terms of capital structure it is important for each individual dairy to know what works for that dairy. The ability to accurately forecast, manage risk, track and analyze data to improve the management of the dairy requires the use of technology at some level. In our business model it is a key part not only for management, but for lenders, capitol partners, and other stake holders. The tools we use are Feed Watch feed tracking software, Dairy Comp 305, Dairy Pro, Time Force, and Mas 90 accounting systems (Figure 1). All of these systems are in some way linked to Electronic Identification (EID) technology.

Electronic ID technology

Electronic ID technology has been around in the dairy industry for more than thirty years. Early adoptions of the technology were for individual cow ID in milking parlors, sort gates and electronic feeders. These same types of tags are still available today with a few additional options such as activity monitoring. As dairies have become larger there has been greater emphasis placed on putting low cost methods in place that are highly efficient, accurate and effective at assisting producers manage reproduction, herd health, and daily milk yield.

According to the USDA National Animal Health Monitoring System (NAHMS) Dairy 2007 survey, 93% of cows and 97.4% of herds in the survey had some form of individual ID. Of the herds with individual ID, 4.1% of operations and 9% of cows utilized electronic ID as the method to ID at least some of the cows in the herds surveyed. In this survey, methods of electronic ID included transponders, Radio Frequency Identification (RFID) tags and bar codes. A lower percentage of farms (54%) with approximately 36% of the operations surveyed had herd ID on the individual cows.

The National Animal Identification System (NAIS) is a partnership between state, federal and industry partnership designed to assist producers with dealing with and controlling future disease outbreaks. Currently three states have mandatory programs in Indiana, Michigan and Wisconsin. NAIS programs use a tamper proof “840” tag that is NAIS compliant. Recently, New Mexico implemented a tuberculosis control program that utilizes “840” tags to track animals in the program. Other states, like Arizona, have approved “840” tags to be used for official ID for “Milk Ordinance”

TB testing that is done in the state on a tri-annual basis and for such identification purposes for health certificates and calf hood vaccination. Utilizing RFID technology on dairy farms does not require the use of official “840” tags. There are several manufacturers of RFID tags that are not NAIS compliant that are being utilized on dairy farms across the US.

Implementing RFID technology at Ultimilk Dairy Company

Ultimilk Dairy Company is a 6000 cow dairy operation that began milking cows as startup company and dairy in March 2007. From the beginning, it was decided to implement electronic ID technology in order to help obtain a high degree of record accuracy as rapidly as possible. Re-usable ear tags purchased from Westphalia-Surge were chosen as they could be used to ID cows in the milking parlor for daily monitoring of milk weights in addition to being utilized for herd management.

As the first cows arrived, they were processed with a bangle tag in each ear with the cow’s visible ID and an RFID tag placed in the left ear. As the tags were placed in the cows, Pocket Cow Card (PCC) from Valley Ag Software was utilized to read the RFID tags and coordinate the RFID tag with the correct new visible ID number and previous visible ID number. In addition to accurately coordinating RFID and visible ID’s, it allowed for placement of the cow in the proper pen at the same time.

Cows were obtained from several farms with many different record keeping systems. Cows from farms using Dairy Comp 305 were easily integrated with Ultimilk’s system. Cows from farms using other management programs required a large amount of data entry but this was expedited by utilizing RFID readers. Now, as the dairy brings replacement animals into the herd, they are given an RFID tag at calving.

Utilizing RFID technology in the reproductive and herd health program

Reproduction: Before any cows arrived at the dairy, it was decided to use a Presynch-Ovsynch program and all open cows were to be re-bred using the Resynch program. The reproductive program has not been changed since the dairy started up with the exception of timing for administration of the breeding GnRh and selective CIDR use (> 140 DIM and open).

The dairy’s voluntary wait period was determined to be 42 days for cows and heifers. Breeder’s tail chalk cows every day to detect heats and breed cows. Breeders are allowed to “cherry pick” cows in heat off the second prostaglandin shot. All cows that have not come in heat 14 days later are started on the Ovsynch shot program with the goal to have all cows inseminated by 68 days in milk. Currently the dairy has 99% of the cows having their first breeding by 68 DIM with 73% of those bred on standing heat thus not requiring timed insemination.

The Resynch program is initiated 32-38 days after the previous heat with all cows in that range receiving GnRH. Cows are preg checked the following week and any open cows are given prostaglandin at that time. After a pen is completed, the Pocket Cow Card tells us immediately which cows we are missing in order to minimize missed cows. Recently, we completed a vet check

across seven pens (> 2200 cows) of cows and were only missing one cow that had moved to the special needs barn that morning. Currently, 70% of our cows are pregnant by 150DIM, our calving interval is 13.6 months, and pregnancy rate is 20% and has been increasing steadily since beginning operation in 2007. Breeding shots are administered during the pregnancy check with the exception of the breeding GnRH which is administered according to a TAI-56 hour protocol.

Utilizing RFID and Pocket Cow Card on all cows that freshened on the dairy to effectively enroll them into the repro program as they reached the correct DIM is efficient and easy to implement. The challenge came from cows that were milking upon arrival at the dairy. All cows, regardless of what the records from the previous dairy indicated were given 35 days or more on the dairy before being preg checked and placing open cows into the synchronization program to be utilized on “No Heat” cows. In the meantime, the cows were tail chalked and bred accordingly.

The breeders carry a handheld computer running Pocket Cow Card with them and enter breeding data as the cows are bred eliminating data entry errors. In addition, they have all the cow’s vital information available to them should there be cows with health issues or are potential aborts. After preg checks and breedings are completed for the day, all of the day’s information is downloaded into Dairy Comp 305 in a matter of minutes via wireless connection. Data entry errors are minimized as manual entry has been eliminated. RFID technology and Pocket Cow Card has assisted us in obtaining the level of compliance necessary to have a respectable reproductive program.

Herd health: Daily hospital lists are automatically compiled in DC 305, listing each animal in the hospital pen, current or past treatments, along with important information needed to access the animal’s health such as Milk, DIM, DCC, past events, etc. These lists are refreshed into the Pocket Cow Card daily and available to be referenced during the treatment of hospital animals. Each animal in the hospital pen can be scanned (using the RFID scanner) and the handheld computer will distinguish what she is currently being treated for, how long she has been on treatment, days in the hospital, and what her daily treatment should be. If the animal has finished treatment the handheld will instruct you to “evaluate and hold” the animal until withdrawal periods are met. If an animal is being held until she is eligible to be returned to the milk string or sold, the Pocket Cow Card will inform you for example she is “ready for beef.”

In DC 305 most common health problems encountered in the hospital pen have assigned treatment protocols. With each protocol there are an automatic number of days the animal is assigned to the treatment, and a milk and beef withholding date for that specific treatment. For example, if it is entered that an animal has metritis and is being treated with Polyflex, an antibiotic, DC 305 will automatically move that animal to the hospital pen, and assign her to the protocol selected assigning the appropriate milk withholding and beef withholding date from the final treatment day. When new animals are brought to the hospital pen, the Pocket Cow Card allows the retrieval of all the current and past information for the animal that may be helpful in assessing her current situation. It also allows hospital personnel to enter new treatments based on the written protocols in DC 305. In addition, the Pocket Cow Card can also be utilized in the process of culling animals as all milk and

beef withholding dates are automatically updated when a hospital treatment is applied. Therefore, on days when animals are being sent to market the information needed to make a decision as to whether an animal is eligible to be sold is immediately available. It also allows hospital personnel to view the milk withholding dates on currently treated animals so that animals can be sampled and returned to the general herd efficiently.

Fresh Checks: All recently freshened animals are palpated 3, 6, and 9 days after parturition. Each day, DC 305 automatically generates a list of fresh cows and heifers needing to be checked. This list is refreshed onto the handheld at the same time the hospital list is uploaded and utilized by personnel to track an animal's progress through the transition period. The generated list contains DIM, calving ease, current milk yield, and any recent hospital events or treatments. During the fresh checks animals are scanned and the handheld will instruct personnel to "check for residue" on normal 3, 6, and 9 day checks, or will ask to "treat this cow" for fresh animals currently being treated for common transition disorders. Like new hospital treatments, the fresh check list also gives the option to add new treatments off the protocol list in DC 305, and can move animals directly to the hospital as needed, or enter treatments that can be conducted in the fresh pen.

At the conclusion of each day, the two herd health lists (hospital and fresh cow) can be posted in the handheld computer and wirelessly transferred directly to DC 305 within seconds. The use of RFID technology drastically decreases the amount of labor time required to manage health records, and minimizes the chance for errors to occur with manual entry of treatments, and milk or beef withdrawal dates therefore minimizing any occurrences of antibiotics in milk tanks or animals sent to market.

Other uses for RFID technology

Having all cows identified with electronic IDs allows us to monitor individual cow's daily milk production, and with the milk meter system, parlor performance can be monitored on a daily basis, and pen location can be determined at each milking. At weekly vet checks, cows that are located in a pen not in agreement with DC 305 will be found and can either moved to her correct pen or simply have the pen changed in the hand held computer. Accurate pen inventories are essential to maximize feed efficiency and minimize feed wastage as these inventories are utilized by Feed Watch to develop load sheets for feed mixing.

Cow management activities such as drying cows off, pen moves, preg checks, timed AI and beef lists are simplified by increasing the speed at which cows can be found. The RFID scanner and Pocket Cow Card scan cows just about as fast as an individual can walk thus speeding up finding cows by at least two fold. When the hand held computers are returned to the office, we can tell whether cows were found by analyzing the scan date and time information to check on employee performance.

Other Technology/Software

Feed watch: is used to track inventory, shrink, dry matter intakes, and to make diet changes. Intakes are tracked daily, feeds are purchased through a PO system (laid out very simply using calendar on outlook) and inventory is tracked weekly with monthly reconciliation that compared variances with both price and quantity fed (figure 2).

Mas 90: accounting software integrates our production, labor, accounting, and overall financial systems. Weekly production data is compiled and used to communicate within the management team as well as with the herd nutritionists and veterinarian (weekly reports, weeks since fresh DC 305, etc).

Asset keeper: is used for tracking assets and depreciation.

Time force time clock: is easy to use and set up and requires an employee's fingerprint to physically punch in and out and can also allow for punching in and out on-line for those employees that may work from off site on occasion. Time force runs as a hosted on-line application that eliminates manual collection of payroll information, simplifies time and attendance/tardiness process, reduces errors, time theft and subsequent over and under payments associated with payroll. Employees are paid incentives utilizing this technology for attendance and tardiness in addition to an overall department's respective performance based incentives. For example, in the parlor, we offer \$100/month to all milkers, pushers, and scrapers. The bonus is broken out \$15 for safety (this has essentially eliminated accidents), \$15 dollars for >99% attendance and tardiness as tracked by time force (we often go 90-120 days without losing or hiring in this department), and up to \$70 for milk quality bonus tied directly to our customer in terms of how we are paid.

The primary financial tools used to manage the dairy are risk management oriented, and involve hedging inputs (Figure 3) and hedging milk (Figure 4). Each of the previously mentioned software is more efficient and accurate through EID technology.

Conclusion

Utilizing RFID technology partnered with Dairy Comp 305 and Pocket Cow Card, feed watch, and Mas 90 has allowed Ultimilk Dairy Company to establish and maintain a respectable reproductive program and perform many of the essential management activities with a minimal number of employees and increased data accuracy. We consistently implement a maximum lock time of 45 minutes from the last cow returns to the pen which would not be possible without the RFID management systems. The level priority allocated to accurately budget, manage risk, track and analyze data is dependent on management philosophy and overall capital structure of the dairy company, but regardless, EID is efficient and easily integrated into any structure.

Figure 1. Technological tools used

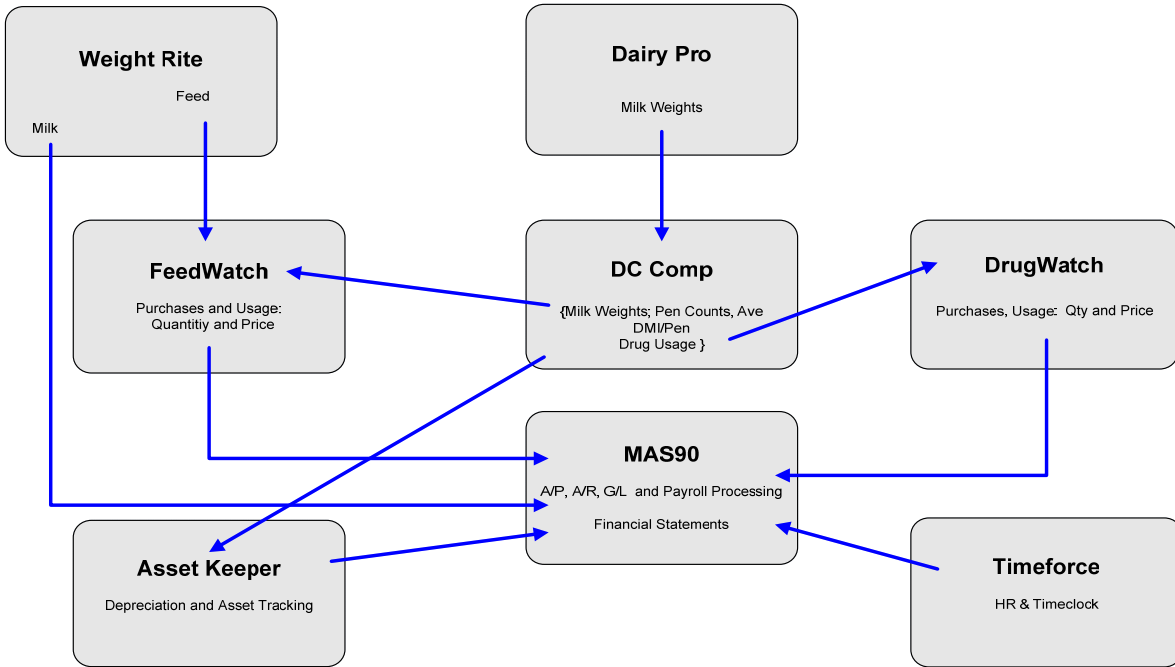


Figure 2. Monthly feed price and quantity reconciliation

Feed	Quantity		Price		Budget Variance		Pricing		Quantity			
	Budget	Actual	%	Budget	Actual	%	Actual	Variance	Budget cost	Actual Cost	Actual	Variance
Corn	3498.7	4744.5	35.6%	\$28.00	27.99	0.0%	\$132,799	\$34,834	\$132,846	-\$47	\$97,930	\$34,869
Silage	797.4	707.7	-11.3%	\$73.00	77.64	6.4%	\$54,943	-\$3,265	\$51,659	\$3,284	\$61,908	-\$6,965
Haylage	342.0	375.1	9.7%	\$385.00	374.72	-2.7%	\$140,539	\$8,861	\$144,395	-\$3,856	\$128,162	\$12,377
Cottonseed	761.2	776.9	2.1%	\$190.71	192.48	0.9%	\$149,543	\$4,373	\$148,168	\$1,375	\$146,517	\$3,026
Corn	198.7	247.3	24.4%	\$162.11	138.58	-14.5%	\$34,263	\$2,047	\$40,082	-\$5,819	\$27,539	\$6,724
Sweet												
Bran	1245.1	1266.2	1.7%	\$73.01	73.01	0.0%	\$92,448	\$1,541	\$92,448	\$0	\$90,907	\$1,541
SoyBest	164.5	190.6	15.9%	\$306.00	387.91	26.8%	\$73,920	\$23,595	\$58,311	\$15,609	\$63,796	\$10,124
Hay	568.7	642.3	12.9%	\$212.00	220.42	4.0%	\$141,580	\$21,009	\$136,173	\$5,407	\$125,358	\$16,222
Soy Chlor	0.0	7.8		\$0.00	507.16		\$3,943	\$3,943	\$0	\$3,943	\$0	\$3,943
Straw	0.0	17.6		\$0.00	105.00		\$1,850	\$1,850	\$0	\$1,850	\$0	\$1,850
Minerals	132.2											
Fat	67.4	39.9	-40.9%	\$945.00	950.78	0.6%	\$37,918	-\$25,813	\$37,687	\$231	\$64,121	-\$26,203
milk cow	120.3	136.5	13.5%	\$1,100.00	729.44	-33.7%	\$99,573	-\$32,759	\$150,155	-\$50,583	\$87,754	\$11,819
fresh cow	2.6	4.2	58.4%	\$1,100.00	1,185.02	7.7%	\$4,963	\$2,054	\$4,607	\$356	\$3,133	\$1,830
Close up	5.3	3.3	-55.3%	\$1,100.00	1,550.88	41.0%	\$3,664	-\$2,153	\$2,599	\$1,065	\$8,201	-\$5,966
Cow	2.6	5.7	115.8%	\$1,100.00	1,552.19	41.1%	\$8,857	\$5,949	\$6,277	\$2,580	\$4,104	\$4,753
Close up	4.1	3.0	-27.5%	\$1,100.00	1,273.65	15.8%	\$3,821	-\$733	\$3,300	\$521	\$5,273	-\$1,452
Hfr												
Far off												
Dry												
Bred Hfrs	1.3	0.0	100.0%	\$700.00	0	100.0%	\$0	-\$925	\$0	\$0	\$0	\$0
Total	7780.2	9167.6	17.38%	\$504.40	\$549.82	9.00%	\$984,624	\$44,409	\$1,008,708	-\$24,083	\$914,702	\$68,493
Average												

Figure 3. Milk to feed margin analysis for hedging decisions

Milk-Feed “Margin”

PRICE OPPORTUNITIES TOTAL IMPACT	7/6/2008	Ave thru 12/08	Average 2009
Budgeted Margin over Feed Costs	12.51	10.22	10.22
Revised Margin over Feed Costs	14.25	11.73	11.73
Milk-Feed Margin vs. Budget	1.73	1.51	1.51
Milk Price vs. Budget	2.43	3.62	3.62
Corn variance vs. budget	-	-	-
Grain Corn	(0.54)	(0.69)	(0.69)
Silage	-	0.19	0.19
Sweet Bran Variance	-	(0.53)	(0.53)
DDGS	(0.07)	(0.16)	(0.16)
Total Corn Impact	(0.61)	(1.19)	(1.19)
By pass SBM	-	(0.21)	(0.21)
Alfalfa	0.06	(0.18)	(0.18)
Alfalfa Haylage	-	(0.05)	(0.05)
WCS	(0.15)	(0.39)	(0.39)
By pass fat	-	(0.01)	(0.01)
Supplement	-	(0.06)	(0.06)
Vitamin/Mineral	-	(0.02)	(0.02)
Net Feed Margin Variance	(0.70)	(2.11)	(2.11)
Liquidity	\$ 2,212,181	\$ 5,659,199	\$ 5,659,199
Liquidity better (worse) than plan	\$ 882,500	\$ 2,629,271	\$ 2,629,271

