

Using Standard Operating Procedures to Improve Employee and Cow Productivity

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■ Take Home Messages

- ▶ A standard operating procedure (SOP) is a written step-by-step set of instructions on how to complete a particular task, just like a cookbook recipe.
- ▶ Properly implemented SOPs help reduce variation in how a task is performed. Dairy cattle thrive on consistency and when tasks such as milking and feeding are performed correctly and consistently, cow performance is optimized.
- ▶ SOPs help employees to understand the work expected of them, and to do it correctly.
- ▶ A well-written SOP makes job training easier.
- ▶ SOPs should be developed with input from the people who will be using them, as well as by the dairy management team and consultants. Development of an SOP should include planning, preparation of a draft, review, modification and testing of the draft and preparation of the working SOP.
- ▶ SOPs are only an adjunct to proper training.
- ▶ SOPs are useless if they sit on a shelf or a computer desktop. They should be printed in all necessary languages and posted where they are used.
- ▶ SOPs should be regarded as living documents and should be reviewed on a regular basis
- ▶ Areas of the dairy where implementation of SOPs can be particularly beneficial are in milking routine and parlor operation, maternity (calving) management, treatment of sick animals, and in fresh cow monitoring programs.

■ Introduction

When multiple people are responsible for a particular task there will be variation in how that task is performed. Standard operating procedures (SOPs) help reduce the variation that occurs when different individuals perform the same task in different ways. Most dairies should aim to have a set of written SOPs that explain how all the different jobs on the dairy are to be performed, i.e. a document that defines how the dairy is operated. This presentation will go through the basics of SOPs and some examples. Every dairy is different and any advice has to be refined for a particular dairy; specific examples of what has worked for some of the clients in our practice at the University of Florida will be discussed.

■ So What is an SOP?

A Standard Operating Procedure (SOP) is simply a written step-by-step set of instructions on how to complete a task. It is just like a cookbook recipe, and gives an employee a detailed description of how to handle a specific task within their job. SOPs help employees to understand the work expected of them.

■ Why Use SOPs?

- ▶ Dairy cattle are creatures of habit. They thrive on consistency. When tasks are performed correctly and consistently, cow performance is optimized.
- ▶ Except for very small farms, dairies typically have multiple employees who milk and care for cows. For example, in a study of 101 Wisconsin farms with an average herd size of 377 cows, there was an average of 6.4 different people (range 2 to 16) milking cows each month (Rodriguez et al, 2005). This provides plenty of opportunity for variation to occur in the way tasks are performed!
- ▶ SOPs help workers to do their job correctly. They provide guidance for an employee who is faced with a situation that requires action. They help eliminate confusion and indecision. A written protocol puts all employees on the same page and helps foster a team approach to getting tasks done correctly and consistently.
- ▶ A well-written SOP makes job training easier. It also helps when someone has to do a job that they don't usually perform. Even small farms with a single owner/worker can benefit from having written protocols so that if someone has to step into that person's shoes in an emergency there are guidelines to follow.

- ▶ SOPs can be prepared in multiple languages and can help reduce misunderstandings when there are language barriers.
- ▶ Data entry can be easier when SOPs are used. Protocols can be incorporated into almost all computerized dairy records systems, helping to reduce mistakes in data entry and records. For example, an SOP for treatment of ketosis might be administration of IV dextrose and oral propylene glycol, followed by rechecking ketones the following day. The person entering cow treatments in the computer can just select the protocol for ketosis and the treatments will be automatically entered and the cow number automatically populated to a list of cows to be checked the following day. Many of you will already be using treatment protocols in this manner; the difference here is also having a written SOP document describing each of those treatment protocols.
- ▶ SOPs for the treatment of health disorders help employees to follow prudent drug use guidelines and reduce the chances of a drug residue violation.
- ▶ The preparation of SOPs provides an excellent opportunity for the producer to work closely with their employees and with experts such as the nutritionist and veterinarian so that everyone understands the goals of each procedure and how that procedure will be performed.
- ▶ Having written procedures for key tasks such as administering injections, milking parlor protocol and handling of down cows can be important for compliance with animal husbandry audits and certification in some dairy quality programs. For example, one of the key components of the US National Dairy Farm Animal Care Program is having SOPs, training and record-keeping in place on the dairy.

■ What Parts of the Dairy Should Have SOPs?

Focusing on the areas that are likely to benefit the most from use of SOPs is a good place to start. For example, if consistency in feed mixing and delivery is an area that could use improvement on a particular dairy, this would be a good place to start with SOPs. Milking procedures is another area that is almost always likely to benefit from the use of written protocols. All dairies should have written protocols for drug use and residue avoidance. Herd health SOPs should detail how to recognize and handle all of the common health problems and preventive health practices on the dairy. Ultimately, every discipline on the dairy (parlor management, feeding, bedding, herd health, reproduction, maternity, calf health, etc.) should have a written protocol that clearly describes what is to be done, how it is to be done and why it is important that it be done that way (Sumrall, 2011).

■ Who Should Prepare the SOPs?

In preparing an SOP the manager should identify the best person to lead the writing effort for that particular area of the dairy, and involve any relevant experts (nutritionist, veterinarian, extension agents, agribusiness reps etc.). Treatment and residue avoidance protocols need to be developed by the herd veterinarian in close collaboration with the manager and employees. Creating written SOPs is a great opportunity to sit down with your team and really think about why you do things a certain way on your dairy and how those procedures fit in with your performance and health goals.

■ How to Write SOPs

Penn State dairy extension has developed some very helpful material on how to prepare SOPs at: <http://extension.psu.edu/animals/dairy/hr/tools-for-dairy-employee-supervisors/ud011> and <http://extension.psu.edu/animals/dairy/hr/tools-for-dairy-employee-supervisors/development>. I've used this material in practice and have referred extensively to it in this talk (see references from Penn State and Stup, 2001).

There are few one-size-fits-all ways of doing things on a dairy so each SOP must be farm-specific. However, there are sample SOPs for dairies available on the internet that can provide a helpful starting point. Example SOPs from the University of Florida Dairy Unit are available at: <http://extension.vetmed.ufl.edu/dairy-extension/publications/>.

Step 1. Planning. The SOP needs to be written with the ultimate goal of the procedure in mind. Thinking about and stating the goal upfront helps guide the development of an effective SOP. Next, identify how the process is currently done and why it is done that way. Should changes be made?

Step 2. Make a draft. Start by making a detailed list of the steps for this task in the order that they should be done. There are a variety of ways to format an SOP; the format chosen should be that which makes the SOP easiest to understand and follow. Routine procedures that are short and require few decisions can be written in simple steps. If there are more than 10 steps, with few decisions, SOPs should generally be written in a hierarchical step or in a graphic format. If the SOP requires many decisions, a flow chart is often the best way to present it. Examples will be provided in the presentation. Generally, each step of an SOP should start with a verb (Strip, Hang, Wipe, Examine, etc.) and should be written in **as briefly as possible** to get the correct message across.


The SOP below was prepared using Microsoft PowerPoint. Further SOP formatting examples, including examples of graphic and flow chart formats,

can be found in the reference Stup, 2001. In addition to Microsoft PowerPoint, there are tools available on the internet to help you prepare flowcharts (e.g. www.gliffy.com).

Step 3. Review the draft. Once an SOP draft is prepared, distribute it to the workers involved in that aspect of the dairy for review. Workers are much more likely to use and follow SOPs if they have been involved in their design and feel a sense of ownership towards them. Also distribute to your technical advisors for review. Revise the procedure as needed.

Step 4. Test the draft by performing it exactly as written. Have someone that does not usually work in that area of the dairy the procedure read the SOP and perform the task. Does it need revising further? Has a critical step been missed?

Example: components of a simple SOP for identification and treatment of health disorders:

<ul style="list-style-type: none"> • Clear and descriptive title • Name of farm • Effective date • Name of main author • # the SOP to help with filing and keeping track of revisions 	<p>Identification and treatment of footrot Dun Milking Dairy: Health Disorders SOP # 10 Effective Date: March 21st, 2012 Developed By: Dr. Blackfoot</p>
<ul style="list-style-type: none"> • Straightforward description • Pictures can be very helpful 	<p>Condition</p> <p>Infected, swollen break in the interdigital skin. May have a reddened, inflamed, swollen foot with foul-smelling interdigital discharge</p> 
<ul style="list-style-type: none"> • Simple protocol (just a few steps) does not require a flow chart or numbering of steps 	<p>Treatment</p> <ul style="list-style-type: none"> • Minor case: No swelling above hoof or around heels <ul style="list-style-type: none"> ○ Clean interdigital area, apply topical KoperTox™ SID for 3 days • Major case: Swelling above hoof or around heels <ul style="list-style-type: none"> ○ Clean and apply KoperTox as above ○ Excenel 1-2ml/100lb SQ SID for 3-5 days¹ <u>OR</u> ○ Procaine Penicillin G 5ml/100 lb IM SID for 4-7 days², apply pink leg bands and move to hospital
<ul style="list-style-type: none"> • Refers to other SOPs for drug use guidelines, as the same antibiotics may be referred to in many different SOPs 	<p>Drug use cautions</p> <p>¹ Label use – see Health Disorders SOP #1 for use of antibiotics ² Caution: Extralabel drug use – see Health Disorders SOP #1 for use of antibiotics for established milk and meat withholding periods</p>

■ **Implementing and Revising SOPs**

The best-prepared document in the world is useless if it sits on a shelf. The SOPs for each discipline of the dairy should be provided to all employees who work in that area of the dairy. Laminated copies should be posted where they can be easily referred to in the workplace.

Each discipline on the farm should have a formal **training program**; this is critical for maintaining a high level of performance and consistency. Training provides the employees with a solid understanding of their role on the dairy and is an opportunity to discuss in detail **why** things need to be done a certain way. **SOPs are only an adjunct to proper training and re-training** and afterwards employees can continue to refer back to them. Refresher training helps employees to stay focused and interested and provides an opportunity to remind them of the goals behind each SOP. Having regular training sessions also sends a message that management takes the person's job seriously and offers an opportunity to review and revise SOPs.

SOPs need to be dynamic documents that will need constant revision as things change on the dairy. Just like the first draft, revisions should be seen by all relevant personnel (workers, management team, consultants) before they are finalized. If no changes are made to SOPs during the year, there should be a formal review annually to make sure that the SOPs remain up-to-date.

■ **The Use of SOPs to Improve Cow and Employee Productivity**

Although there is a great deal of discussion in the lay literature on the benefits of SOPs on dairies, there are actually very few published scientific papers that have critically evaluated them.

SOPs, Parlor Management and Udder Health

Almost all dairy producers recognize that a consistent milking routine is essential to producing quality milk, and there are numerous scientific studies to support this. However, many producers do not provide detailed descriptions of the milking process for their workers. For example, less than 20% of 315 WI dairies had written milking routines in one study (Ruegg, 2001). The application and benefits we have seen from implementation of SOPs at the University of Florida Dairy Unit, where average annual SCC went from 500,000-600,000 to <200,000 over a 4 year period, will be discussed.

SOPs and Obstetrical Procedures

The development and use of SOPs in conjunction with an employee training program can help reduce complications associated with management of the cow at calving. For example, the use of SOPs in a farm-specific employee training program to manage cows at calving was evaluated in a herd that had a high incidence of intra-pelvic calving trauma and postpartum uterine infection. Proper training and provision of revised SOPs to employees

resulted in improved outcomes after calving and improved calving ease scores in primiparous cows (Kristula and Smith, 2011).

SOPs and Monitoring Postpartum Health

The application of a farm-specific, standardized fresh cow monitoring program is an excellent example of the application of an SOP in the herd health program. Diseases that are prevalent in the postpartum period such as metritis and ketosis can have long-term detrimental effects on cow health and reproductive performance. Fresh cow monitoring programs are designed to detect postpartum problems and treat cows early in an attempt to minimize the impact of these disorders. Fresh cow programs need to be farm specific, but they typically involve the monitoring of a few parameters (some combination of rectal temperature, attitude, milk production, uterine discharge, and urine milk or blood ketones) of all cows during the first 10-14 days of the postpartum period by trained farm personnel. Cows with abnormal findings are selected for further physical examination to make a diagnosis, and then treated appropriately. Early intervention can help prevent further disease and improve production outcomes; for example, a fresh cow monitoring program designed to detect and treat cows with mildly elevated ketones resulted in improved milk yield in early lactation and helped prevent development of clinical ketosis (McArt et al, 2011). The application and benefits we have seen from implementation of fresh cow monitoring SOPs in some of our client herds will be presented.

■ References

- Kristula, M.A. and B.I. Smith. 2011. Case Report – Veterinary farm specific employee training to manage dairy cows at calving time. *Bovine Practitioner*. 45:78-86.
- McArt, J.A., D.V. Nydam, P.A. Ospina, and G.R. Oetzel. 2011. A field trial on the effect of propylene glycol on milk yield and resolution of ketosis in fresh cows diagnosed with subclinical ketosis. *J. Dairy Sci.* 94:6011-20.
- Penn State, College of Ag. Sciences; Ag. Res. & Cooperative Extension. Standard Operating Procedures: Development and Implementation. <http://extension.psu.edu/animals/dairy/hr/tools-for-dairy-employee-supervisors/development>
- Rodrigues, A.C., D.Z. Caraviello, and P.L. Ruegg. 2005. Management of Wisconsin dairy herds enrolled in milk quality teams. *J. Dairy Sci.* 88:2660-71.
- Ruegg, P.L. 2005. The 10 smart things dairy farms do to achieve milking excellence. Available at the University of Wisconsin Milk Quality website at: <http://milkquality.wisc.edu/wp-content/uploads/2011/09/ten-smart-things-dairy-farms-do-to-achieve-milking-excellence1.pdf>

- Stup, R. 2001. Standard Operating Procedures: A writing guide. Penn State College of Ag. Sciences; Ag. Res. & Cooperative Extension. <http://extension.psu.edu/animals/dairy/hr/tools-for-dairy-employee-supervisors/ud011>
- Sumrall, D.P. 2011. Managing people in today's production dairy environment. Chapter 23 in: Risco CA & Melendez-Retamal P (eds), Dairy Production Medicine, Wiley-Blackwell.



