

# A Blueprint for Conducting a Veterinary Dairy Farm Audit

Jos Noordhuizen\*

School of Agriculture and Veterinary Science, Charles Sturt University, Wagga Wagga, Australia; VACQA-International, France & Portugal, Santarem, Portugal

\*Corresponding author: Dr. Jos Noordhuizen, School of Agriculture and Veterinary Science, Charles Sturt University, Wagga Wagga, Australia; VACQA-International, France & Portugal, Santarem, Portugal. E-mail id: jos.noordhuizen@orange.fr

## Abstract

Farm situations and herd problems are commonly complex and multifactorial in nature. A dairy farm audit should therefore be well-structured and organized so that the farmer or veterinarian are not lost in their activities. This article presents a blueprint, a model, for conducting a dairy farm audit. For that purpose, an imaginary dairy farm and a herd problem was chosen: Metabolic disorders on a farm with 550 dairy cows. The subsequent steps in the farm audit are elaborated until the final farm audit report and veterinary advises, divided into priority advises and secondary advises.

## Introduction

Different herd health programs and associated programs have been developed over the last decennia [1]. Examples are Biosecurity protocols, Routine Herd Diagnostic Monitoring schemes, Good Dairy Farming Code of Practice and Good Housing Practice [2]. The common feature in these examples is the highly structured and organized way of approaching the dairy farm.

The forenamed programs have the ultimate goal of optimizing herd health and cattle welfare, as well as productivity. More recently, an extended program, addressing the quality of the production process -leading to a certain level of quality of health, welfare and production--on the dairy farm has been proposed [2-4]. This program uses the application of Hazard Analysis Critical Control Points (HACCP)-like principles on dairy farms. This program too is highly structured and organized.

A farm audit addresses most frequently complex farm situations and multifactorial herd problems. In order to be comprehensive and goal-oriented, such a farm audit needs to be structured and well organized too. One of the other main reasons for this approach is that, by following the audit structure (or protocol), the farmer does not get lost in the multitude of activities conducted by the veterinarian.

The objective of this article is to present the practical blueprint model of a farm audit protocol. For that purpose, a fictive farm and or herd problem is used to guide the reader through the different steps in the audit protocol.

## Dairy Farm Audit - Definition

A dairy farm audit is a (veterinary) activity during which an acknowledged veterinary specialist visits a farm on request of the farm manager or owner. During the farm visits, several farming domains are usually addressed, evaluated and analyzed. Strong management points and management points due for improvement are distinguished in the process. Essential element in the process is the synthesis of all findings, evaluated risk factors and the conclusions drawn. On the basis of these findings,

evaluated risks and conclusions, several advisory options for improvement are defined. These options need to be discussed with the farm manager or owner to determine which options would best fit current farm-management.

Then a written farm audit report is composed in which the previously named issues are summarized and the final options described.

It is not uncommon that, after the farm audit, another farm visit is planned to evaluate the effects of advice given and, if necessary, adjust the advice.

For particular situations the presence of another specialist, such as a nutritionist, is warranted. This is valid in particular for milk production and feed related questions and problems.

## Dairy Farm Audit - The Protocol

The reason for the farm audit, as asked by the farm manager, was the finding that too many lactating cows showed signs of metabolic disorders (rumen acidosis, ketosis) over the last weeks. This complaint serves as example to elaborate the farm audit.

In preparation for the farm visit and farm audit it is advised to ask the farmer to send some basic material to the veterinarian. Examples are a description of the farm (geographical location) and the herd (size, predominant breed, average milk yield per cow per 305 days, calving season if any, average calving interval and range, milking parlor design, barn floor and cubicles).

Suppose that the 'example farm' has a herd of 550 predominantly Holstein-Frisian milking cows, with an average milk yield per cow per year of 9300 kg, milk fat percentage 4.10 and milk protein percentage 3.36. The milking herd is housed in two open adjacent barns with cubicles, in 3+2 rows. Cubicle bedding is straw on sand. The first barn comprises fresh cows and mid-lactation cows, the second one end-lactation and dry cows. The herringbone milking parlor 2x12 is located between the two barns. The calving pen is in the first barn, separated from lactating cows. There are several concentrate dispensers in the barns.

Table 1 presents the blueprint of the farm audit protocol. It comprises the different steps to make, with specifications for the fictive ‘example farm’ in the right column.

**Table 1:** The blueprint of a farm audit protocol.

Audit Steps	DETAILS	This Farm
1	<b>Discussion</b> with the farmer for ‘ <b>getting to know each-other</b> ’ and for specifying the complaint(s)	Which are the conditions that may have led to the complaint (calving of cows/heifers; feed & feeding management; housing; climate)
2	<b>Farm tour 1</b> for observations on the basis of Point 1 issues.	Routine diagnostic herd monitoring <sup>A)</sup> of cattle, their environment, risk factors, management, farm records.
	Search for strong points and points for improvement.	Findings are written down on sheets.

3	Drawing the <b>first conclusions</b> based on observations made	The scoring sheets serve to draw first conclusions.
4	<b>Clinical check-up</b> of affected cows	Rumen acidosis and ketosis occur in the first part of lactation (fresh cows)
5	<b>Farm tour 2:</b> sometimes it is necessary to make another farm tour to be sure.	If new cows/heifers calved or on large farms, another tour to is indicated.
6	Drawing <b>final conclusions</b> on all findings	These conclusions are put on paper

Table 2 presents some major issues for routine diagnostic herd monitoring, named in Table 1.

**Table 2:** Overview of major issues for Routine Herd Diagnostic Monitoring (focused on the example farm) with strong points and weak points for improvement.

Heifers + Adult Cows		Housing & Barn Climat		Farm Data	
Body Condition score BCS	Rumen Fill score	Feed rack quality & position	General Hygiene & Cleanness	Feed storage quality	Overall disease data
	RF				
Hind leg posture & Hock lesions HL	Manure quality (consistency & undigested fibers) MQ	Air volume in the barns	Design & Condition of flooring, walls & roofs	Ration composition (TMR or not)	Feed push-ups on the day
Claw condition & quality	Motility scoring MS	Cubicle design & quality	Bedding material in cubicles	Roughage Analyses & Quality	Feed refusals
Cattle density	Lactation groups present	Ease of rising	Social order	Maintenance of milking equipment	Milk quality reports
	Which		Antagonism		Milking parlor
Hygiene of cattle	Rumination frequency	Water drinking points	Water access Water quality	Vaccination schemes	Overall hygiene scores
Clinical check-ups of (newly) affected cows		Heat stress measures taken and evaluated		Milk yield records	Reproduction data

Table 2 comprises the most relevant issues to check in relation to the complaint of metabolic disorders such as rumen acidosis and ketosis. Table 2 is based on known risk factors for these disorders. Note that milk records of fresh cows may give a strong indication about the prevalence of these metabolic disorders. These indications originate from the milk fat percentage and the milk protein percentage on subsequent recording dates. Moreover, poor Rumen Fill and poor Manure Quality scores may indicate such problems as well.

Heat stress is known to possibly induce health problems such as metabolic disorders, due to poor feed intake, poor digestion and general poor cow comfort.

The information also serves to find out whether the complaint of the farmer is justified or not. If not, the protocol has to be adapted of course Table 2.

The scoring of issues named in is done on specific field scoring sheets (not shown), where the abbreviated headings appear on top, and the cow/heifer identity scored at the left side Table 2.

Remark that it is not necessary to score all cattle in the herd. It is sufficient to score a sample of each lactation group (fresh, mid-lactation, end-lactation, dry cows, close-up cows, heifers); for metabolic disorders one may limit the scoring to dry cows, close-up cows, fresh cows and heifers up to 100 days’ lactation.

## Dairy Farm Audit - Conclusions and Report

The conclusions from major findings on the 'example farm' may look as is presented in Table 3.

**Table 3:** An overview of the most important findings and conclusions from the farm audit.

Milk records, RF scores, MQ scores indicate indeed the presence of metabolic disorders.
Both ketosis and rumen acidosis are prevalent; last cows calved show positive tests.
Milk yield per cow is okay in average, but a wide variation between cows exists. Especially lactating heifers show too low milk yield and deviating milk fat and protein percentages.
BCS in lactating heifers is not optimal; they show poor RF scores too. They are not ruminating as they should. There is no separate group for lactating heifers, so they are subject to social stress. A separate group is necessary for them.
Feed quality observed is okay; the TMR is well-composed following the rules. The feed is pushed up three times per day which is okay. Keep an eye on ration fiber content.
No claw health problems were observed. The floors in barn 1 and 2 are wet, full of manure. The floors should be scraped more often (4 to 6 times per day) to avoid claw problems.
Motility scores were okay in general, but a few cows showed a score of 2 which is a first alarm for the presence of claw lesions. Instruct the claw trimmer to follow up these cows.
No hock lesions were observed; hence, cubicles and their bedding are okay. The number of cows with poor hind leg posture is very low but they are present. See preceding point.
Barn climate is okay. In case of heat stress periods, it is advised to install sprinklers over the feed rack covering the cows' back to increase the cooling effect of the installed fans.
Milking equipment, hygiene, milking practice and milkers were all okay.

This Table 3 shows the strong points and the points for improvement (the latter sounds nicer than 'weak points'). Given the fact that this is an overall summary, the veterinarian needs to draw up a "priority short list" of actions to take.

Such a priority list is presented in Table 4.

**Table 4:** Summary of priority and secondary advises given by the veterinarian and adopted by the farmer after discussion.

Priorities:	Description of the action to be taken
1	Create a separate lactation group for fresh heifers. This will help them in adapting to the new housing, increasing their feed intake, improving their cow comfort, hence increasing their milk yield
2	If heat stress periods are expected to occur, be prepared on beforehand. This means installing low pressure sprinklers above on the feed rack to cool down cows during the day and maybe the night (be sure that cubicles are not impacted, nor cows' head). Activate the fans from 23°C onward at 8-9 km/h. Check udder hygiene of cows at milking (wet udders are not desirable).

3	Let the claw trimmer make a follow-up of cows with increased motility scores. He could also be trained in scoring motility in lactating cows (records).
4	Activate the manure scraper 4-6 times on the day to keep the barn floor clean
5	The farmer should conduct a follow-up of milk records and RF + MQ scores of newly calved cows and heifers to detect potential new metabolic disorders.
Secondary:	
A	Check cow and udder hygiene more thoroughly in heat stress periods
B	Keep an eye on the ration fiber content; optimize when indicated (see MQ)
C	Since it was observed that medicinal drugs were stored at the entrance of the calf barn, during the day in the sun, it is advised to remove that storage and place a refrigerator at the inside, far from the entrance, to preserve the drugs. Moreover, several bottles of the same drugs were opened. It is advised to open just one bottle at the time, write the date of opening on it and check the limiting date. Other, new, bottles can be left in the refrigerator for later.

Observations made (strong points + weak points) & Remarks.

Note that there should never be more than 5 priority actions listed. If more than 5 are listed, the farmer may become demotivated or lost in what to do. Other, secondary improvement actions need to wait: When one priority action shows effect, this action can be replaced by a secondary action.

Table 3 does not comprise all findings good or poor for reasons of simplicity; it would go beyond the scope of this article to address them all.

What is imperative is that the veterinarian should list the strong points too and not limit him/herself to the points for improvement. The reason is that the farmer feels good seeing his strong points too and then the acceptance of points for improvement is higher. This will increase his compliance to make improvements.

The conclusions and in particular the priority points of advice have to be discussed with the farmer to find out what is fit for his management style, whether it is economically acceptable, and whether he thinks that farmworkers will adopt the proposed improvements. With regard to the latter issue, the veterinarian may propose to the farmer short time practical training sessions for specific domains. An example is training the farmworkers in scoring Rumen Fill and Manure Quality scores. This training usually does not take more than one or two hours.

## Concluding Discussion

When conducting a farm audit, it is not unusual to find variation in routine herd diagnostic monitoring scores [2]. The

majority of a group of cows may show a good average score, but it is the variation which is important. That variation should be kept as limited as possible; that is called 'management by exception'. We are looking for deviating scores in animals and draw our conclusions on the different findings.

In this article summaries are presented to increase readability.

A full farm audit report may comprise up to 8 pages. In this report too, a clear shorthand writing style should be strived for. That report should be structured according to the order of items in the protocol as named in Table 1.

One may choose for coloring strong points green and points for improvement yellow. That may help the farmer in keeping the overview.

It may have become clear that the mentality and the attitude of the farm manager are crucial for a successful farm audit and positive effects of audit advises. When a farm manager is available throughout the whole process of auditing, this will create a joint effort and understanding while the success rate is high and the degree of satisfactory is great at both sides: farmer and veterinarian. This is not always the case according to the experience of the author.

Advices to the farmer should be formulated in a SMART way [5]. SMART in this context means: Specific, Measurable, Achievable, Realistic, Time-set. This may help in choosing the right wording and a shorthand writing.

A follow-up farm visits to evaluate the effects of actions taken may be done in two ways: (1) at distance using E-mail and sending resp. evaluating data sent by the farmer, or (2) a physical new visit to the farm. The former may -for the example farm-concern milk yield records and scoring results. During the latter,

the Routine Herd Diagnostic Monitoring will be applied to find out whether the points of improvement have diminished and whether the problem has been eliminated. The key is to compare records and findings of the problem period with the same data in the follow-up period. It is the farmer who decides which type of visit he wants.

The reason to choose an external veterinary specialist for conducting a farm audit is mainly that this person is in a neutral position, while the local veterinarian might be biased due to his frequent contacts with the farmer. The questions and observations of this external person, as well as his/her advice, have another weight than that of the local veterinarian.

## References

1. Brand A., Noordhuizen JPTM, Schukken YH. Herd health and production management in dairy practice. Wageningen Academic Publishers, Wageningen, The Netherlands. 2001.
2. Noordhuizen J. Dairy herd health & management: a guide for veterinarians and dairy professionals. CONTEXT Products Ltd., Packington, UK. 2012.
3. Carlson KR. Quality and Environmental Stewardship - consultation guide. Milk & Dairy Beef Quality Assurance Center, Straford IA, USA. See also [www.DQACenter.org/university](http://www.DQACenter.org/university). 2000.
4. Noordhuizen J, Cannas da Silva J, Boersema SJ, Vieira A. Applying HACCP-based Quality Risk Management on Dairy Farms. 1st Edition. Wageningen Academic Publishers, Wageningen, Netherlands. 2000.
5. Speksnijder D. [www.boerderij.nl](http://www.boerderij.nl) consulted. 2017.