



A PRACTICAL GUIDE TO HERD HEALTH MANAGEMENT in pigs, dairy and small ruminants

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Introduction

Herd Health Management (HHM) is critical in improving the health and welfare and thereby the productivity of the livestock at a farm or in a herd (Figure 1). This guide is not for finding out “what to do”, it is rather a tool for “how to” improve the health at a farm. In HHM, one does not focus on a single disease in a single animal, but rather on general farm conditions like access to feed and water, overall health status and disease prevention, reproductive performance and corresponding practices. This guide is adapted for non-pastoralist pig, dairy and small ruminant farming systems.

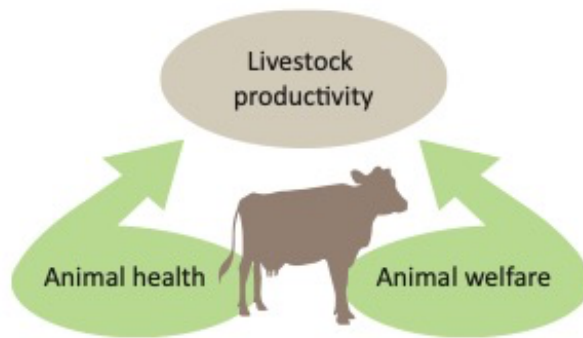


Figure 1. Outlining the interconnectedness between animal health and welfare (both entities support each other), and how they contribute to better productivity in livestock.

It should be noted that this approach requires a skilled veterinarian in collaboration with veterinary paraprofessionals, with broad experience and who is able to work in partnership with the farmer and provide adequate advice when needed. Herd Health Management is a continuous process and with a mutual commitment from the animal health professional and the farmer where they work together. The objective analysis of the current situation is necessary to identify the farmer’s motivation for keeping livestock, visions and challenges, and to decide which areas to focus on for optimization of the livestock production or problem solving, which measures to be taken and agree on who is responsible for the tasks and for follow-ups. Herd Health Management is thus a participatory process over a long time-span - a gradual and iterative approach to improved health, welfare and productivity that is tailor made for the particular farm. The current framework is based on experiences from Sweden, East Africa and Central and South East Asia. The guide is primarily aimed for a veterinarian. However, it might also be useful for other skilled animal health professionals if veterinarians are not available.

In brief the starting point is a thorough analysis of the farm ending up in identifying a set of “bottle-necks” that hamper the productivity at the farm (details are described below). These are discussed by the animal health professional and farmer, and then they decide “to solve” one or two of these so called “focus areas” and set achievable – considering the resources at hand - goals to be reached within a certain time frame. It is crucial at this first round to go for the most “low hanging fruits” when making this decision so progress can be seen. In other words, the feasibility with respect to time and economic resources and commitment from the farmer is key. After an agreed time period, there is a follow up to review progress.

If successful the next focus area is approached in the same way. If not successful, a thorough analysis is made for identifying why there was a failure and appropriate adjustments are made and a new round is implemented. However, it is of outmost importance that the first turn-around is successful in order to keep the farmer motivated for this long-term process. A very practical advice is then to be not too ambitious in the beginning!

The process

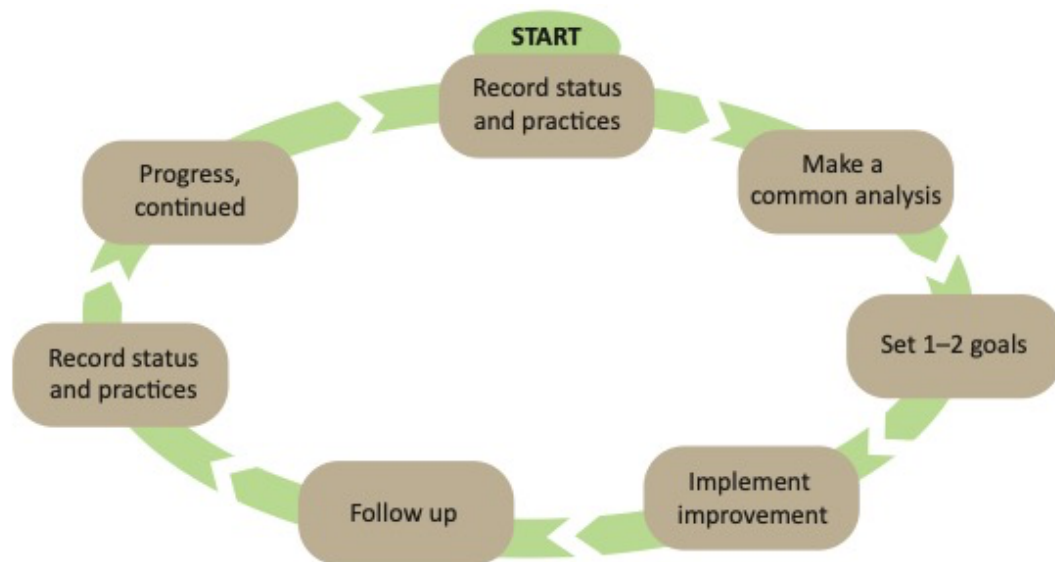


Figure 2. A schematic view on the herd health management performed over time

How to do it practically: The general outline of this process is presented in figure 2. To support the process, you find protocols in the subsequent sections in this guide called “Herd health framework” for each species. Also, at the very end there is a “Health plan and Actions” template that should be used by the veterinarian and farmer. As shown above, the herd health management process comprises a sequence of visits that are summarized as bullet-points below. Details about the different elements at the visits are described after these bullet-points:

- At the first visit, the veterinarian interviews the farmer. Any documents on the animals present are reviewed, the animals and the premises are inspected, and routines are scrutinized. Sampling of any specimens for analysis, treatments or other measures deemed adequate may be carried out. The veterinarian and the farmer agree on what data should be recorded and documented on a continuous basis and provided at the next visit. Following the visit, the veterinarian compiles all information, analyses the data collected and identifies a few problems or areas to be optimized, which could be turned into quickly feasible goals.
- At the next visit, the goals and a plan (including a time-line) to meet these goals are discussed and agreed upon together with the farmer. The data recorded since the last visit are scrutinized and the animals and premises are inspected. Sampling of any specimens for analysis, treatments or other measures deemed adequate may be carried out.
- At each following visit, the recorded data are scrutinized, the animals are inspected, eventual sampling and other measures are carried through, and a follow-up is made

on the goals set up at the previous visits. As the previous goals are met (or for various reasons turned down), new goals are identified and implemented.

Farmer interview: The veterinarian asks for the farmer's objective with the production, and their goals and long-term visions in order to capture the motivation and the experienced challenges, including hurdles outside the farm that affect livestock production.

Record status and practices: The veterinarian records production and health status of the livestock, and if applicable, includes information available in herd records. This is the most thorough analysis of the farm during the whole process. At the same visit, the veterinarian records what practices are in place for general farm management, health management, reproductive management and biosecurity (see Box 1). When collecting data at the farm, it is important to note what is observational data and what is reported by the farmer. Templates for collecting these data in pigs, dairy and small ruminants are provided in section II. Notably, the veterinarian who is in charge of supporting the farmer in his or her HHM needs the skills and experience, that covers elements beyond animal diseases like insights into feeding, farmer's economy, animal welfare, and reproductive performance. If the responsible veterinarian is lacking skills in some of the areas she or he can be accompanied by other, relevant professionals. In that case, it is highly recommended for the two to make a joint visit at the farm.

Make a common analysis: The veterinarian analyses the collected data in order to find areas for improvement in production and health status and which practices can be adjusted or changed to achieve this. Some 5-6 options for adjustments or change – that are very likely to improve the health and productivity - are then presented and discussed with the farmer (and others working with the livestock at the farm) so she or he understands the link between changed practice and improved production and health. It is recommended to interview both the female and male household head if they both are involved in the animal keeping as they may have different perspectives on what the key challenges are and which solutions are feasible and acceptable. It is important that consensus is reached between the farmer, farm staff and the animal health professional for any intended action. Action points should be listed including the name of a person responsible and a date for completion. It could either be a task to be performed by the farmer or staff or by a consulted local veterinarian or advisor. Note that this could include gathering of additional data like collecting and analyzing samples for parasitology.

Set 1 or 2 Goals. Following the analysis, the farmer agrees with the animal health professional on one or two production or health goals that are realistic (cost and workload-wise) to be achieved by changing practices. Again, it is critical to select goals that clearly are of economic benefit, so the farmer become convinced about this modus operandi. Obviously, the goal must be measurable and these indicators also need to be agreed with the farmer in advance.

Follow up: It is important that the veterinarian make regular visits to the farm or telephone calls if judged feasible – every or every second month – for supporting the farmer and

checking that the agreed changed practice is indeed followed and if short term goals are being reached or if some adjustments are needed.

Second visit for recording of status and practices (i.e., progress evaluation): This visit is preferably done 6-12 months after the first visit by the veterinarian or the animal health professional. It is a thorough second-round assessment, using the same protocol as in the first visit for evaluation of the changed practices. If successful, then the animal health professional and the farmer agree on another practice to change in the same manner as described above. Alternatively, if not successful, a thorough analysis is made for identifying why there was a failure and appropriate adjustments are made and a new round with the same goal is implemented. This cycle of identification of areas of improvement, analyses, actions and follow ups and adjustments continues.

Funding

The funding for the HHM could vary depending on context: it could be a part of a governmental extension service, entirely paid by fees from the farmer or a mix of these two. It is beyond the scope of this guide to elaborate further on the funding, albeit for the viability of the HHM it is crucial that the productivity of the farmers' livestock improves and thereby their income. Thus, there is a considerable responsibility for the veterinarian to make the progress to happen.

Box 1. In this guide the following terminology is used

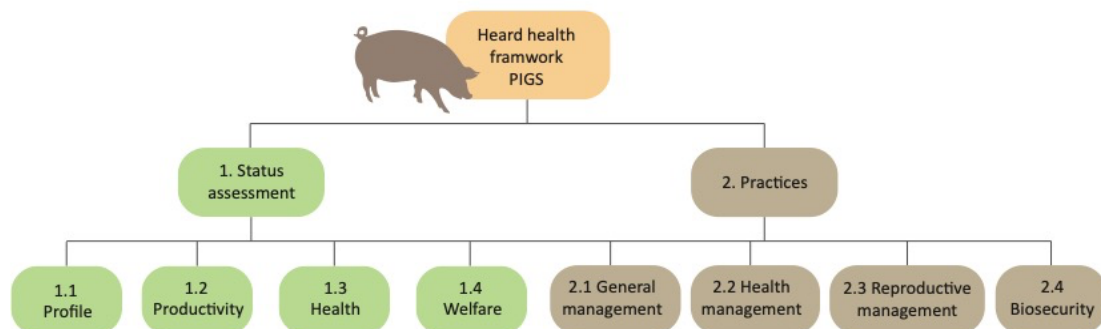
General farm management: Housing, type of pigs, buying/selling pigs, feeding regimes etc

Health management: vaccination and deworming routines, access and use of animal health services and pharmaceuticals etc

Reproductive management: Breeding routine (e.g. A.I., own boar), heat detection, weaning routine

Biosecurity: Procedures for animals and humans to enter the farm etc.

Herd health management framework – pig farm



1. Status assessment

1.1 Profile

Aim: Evaluate the overarching goal for the pig production to identify the level of engagement and willingness to perform any suggested interventions.

Execution: Interview the owner of the pigs, the person in charge of daily management and others at the farm to ensure different perspectives

- Why do you keep pigs?
 - o Income, consumption etc...
- Aim/goals/motivation/future plans/improvements of the farmer
 - o eg Are you content with your current production?
 - o How would you like to change/improve?
- Who handles the pigs?
 - o Different people for different tasks? Which tasks?
 - o Are children involved in the management?
- What is the main focus/type of the production?
 - o Piglet producing
 - o Fattening pigs
 - o Integrated
- Main reason for slaughtering or selling

- Certain age
 - Certain size
 - When money is needed
 - Other (e.g, is the farm involved in some development program run by government, NGO etc)*
- What breed do you have?
 - Exotic
 - Mixed
 - Local

1.2 Productivity

Aim: Evaluate current knowledge on production figures and emphasize the importance of record keeping.

Execution: Interview the person in charge of daily management. Scrutinize and encourage continuous record keeping. Perform additional measurements, combine observations and information retrieved.

- Number of pigs

Specified per category: Suckling piglets, Growers (weaning until selling/slaughter), Sows/gilts, Boars
- Number of piglets born per litter
 - Born alive
 - Stillborn
- Litters per sow per year

Total number of litters in one year, divided by the number of sows in the herd
- Number of piglets born alive/weaned/pigs for slaughter per sow per year

Total number of pigs of a certain category in one year, divided by the number of sows in the herd. This is probably not information that can be retrieved in a good way by a single visit

- Piglet mortality

Total number of piglets that have died after birth but before weaning in a herd during a set time period, divided by the total number of piglets born alive during the same time period.

- Weaning age

- Mortality, growers

Total number of growers that have died in a herd during a set time period, divided by the total number of growers in a herd during a set time period

- Weight/growth

Weights or measurements taken at the visit of growing pigs, together with the age of the pig(s). It might be a good idea to ask about date or month of birth, instead of "age".

Measurements by measuring tapes and converted to kilograms, eg (Mutua et al., 2011) or (Walugembe et al., 2014)

Total growth is calculated by (the weight in kg) divided by (the age in days).

If several pigs, one can combine the figures into a mean of all growing pigs

- Sows, farrowing interval

The number of days between one farrowing and the next. For each individual sow, combined into a mean of all sows

- Sows, time from weaning until first heat

For each individual sow, combined into a mean of all sows.

- Return to estrus

If a sow returns to estrus after service

- Age at first farrowing

For gilts. On individual level, then combined into a mean of all gilts.

1.3 Health

Aim: Evaluate health issues within the herd past 12 months/ since the last visit.

Execution: Divided into what can be observed and what is information retrieved by informant. Observations are carried out by a veterinarian at time of visit. Perform adequate clinical examinations to confirm diagnoses, if possible.

Have there been any health issues in the last twelve months or since the last visit (Include both interview answers and observations)?

If yes;

- Which category (-ies) of pigs?
 - Suckling piglets
 - Growers (weaning until selling)
 - Adults (breeding stock - sow/gilts or boars)
- Classification of severity of illnesses;
 - 0) Not experienced/observed
 - 1) A single or a few pigs are/have been showing mild signs
 - 2) Several pigs are/have been showing mild signs, or a few pigs are/have been showing moderate signs (including general depression)
 - 3) Pigs are/have been showing severe signs, or have died
- Diarrhea
- Cough/respiratory signs
- Fever/huddling
- Lameness
- Pruritus
- Other diseases in the skin
- General illness (depression, fever, reduced appetite, blueish/reddish discoloration of skin)
- Rough hair coat
- Dysgalactia
- Reproductive failures

- Abortion
- Stillbirths *including mummified (black) fetuses*
- Repeated breeding
- Neurological signs/ataxia
- Measuring of rectal temperature?
- Any laboratory diagnosis (written statement)?

1.4 Welfare aspects not covered elsewhere

- How do you transport pigs coming to or from your farm?
- Do the pigs suffer from injuries/wounds?
- Disturbed behavior (*e.g. great fear from humans; stereotypic behaviour*)

2. Practices

2.1 General Management and housing

Aim: Evaluate environmental parameters and management practices.

Execution: Combination of observed parameters and information retrieval from the person in charge of daily management.

- Records
 - Identity (individual identification) markings?
 - Production figures
 - Health and treatments
 - Reproduction
 - Biosecurity *eg visitors' log, buying/selling animals*
- Housing
 - Confined *If confined: ground floor, solid concrete, slatted or raised floor; roofed or open air*
 - Tethered
 - Rooming freely

- Deviations from this?
- Bedding material
 - No
 - Yes, *what type*
- Cleaning
 - How? Sweep, water, detergent, disinfectant...
 - How often?
 - Cleanliness observed
- Nutrition
- Body condition
 - Sow
 - Piglets
- Feed
 - Bought
 - Produced at the farm
- Swill feed
 - Composition of the feed (components)
 - For different categories of pigs
 - Are antibiotics included?
 - How much?
 - For different categories of pigs
- Water
 - How much?
 - How often?
 - Source?
- Piglet routines

- Do you monitor farrowings?
 - Yes
 - No
- Do you do anything to provide piglets with extra heat and other extra care to the piglets?
eg creep area
- Do you trim the teeth?
 - cutting
 - grinding
- Do you do anything to cool the animals?
 - No
 - Yes (*How or what, eg shade, water, mud baths...*)

2.2 Health services and drugs

Aim: Evaluate the adequacy of performed treatments and keeping of records on treatments.

Evaluate the knowledge of disease occurrence and handling of diseased animals.

Execution: Interview the person in charge of daily management. Scrutinize and encourage continuous record keeping. When applicable, perform strategic visits and targeted sampling.

- Who do you turn to for advice or help when you have sick animals?
- How often do you have contact with an animal health professional?
- How often do you have contact with drug seller?
- How do you know if a pig is sick?
- Do you diagnose animals yourself?
- Do you buy drugs, to treat your animals, yourself?
If yes: What drugs? Where do you buy the drugs?
- For what purposes? *Which diseases do you treat yourself?*
- Treatment routines
 - Deworming

- Against ectoparasites (*lice, mange, fleas...*)
- Antibiotics
- Vitamins
 - What type? *Injection, substance given orally, on the skin and what drug?*
- Iron newborn piglets
 - What type? *Injection, drug, earth, peat...*
- Vaccination
 - Against what disease?
 - What drug? *Note if antibiotics*

2.3 Reproductive management

Aim: Evaluate management routines specific for reproductive performance

Execution: Interview the person in charge of daily management. If applicable, perform strategic visits and targeted sampling.

- Heat
 - How is heat detected?
 - When do you look for heat? *Times per day/week, after weaning...*
- Service. When is the sow served? *In relation to heat*
 - Artificial insemination
 - Natural insemination *If natural:*
 - Own boar
 - Village/community boar
 - Other
 - How long time is the sow with a boar?
 - How many times are the sow brought to the boar/mated during one heat”

- Routines first month after service?
- Weaning procedures
 - Sow or piglets removed?
 - Other routines *eg successive weaning*
 - Do you provide feed to piglets before weaning?
The same as the sows, other?"
 - What type of feed do you provide to the newly weaned pigs?
The same as to the sows, other?
 - How many times a day do you feed the newly weaned pigs?
 - What amount of feed are they provided?
- Castration routines
 - When/age?
 - How?
 - Performed by whom?
 - Why?

2.4 Biosecurity

Aim: evaluate risk management of disease transmission, both inter- and intraspecies, with particular emphasis to animal trading.

Execution: Interview the person in charge of daily management and combine with own observations.

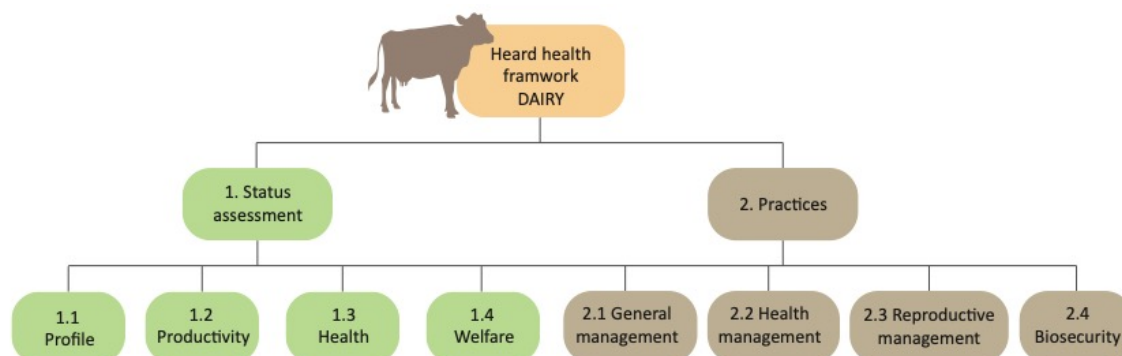
- Recruitment *How they expand the herd or replace sold or culled animals*
 - Own produce
 - Buying
- How many pigs have you bought or received the last year?
 - Of different categories (*Suckling*) piglets, growers, adults
 - What ages?
 - From where do the pigs come from?

- The same or
 - Different sources?
- Quarantine *for newly bought/received pigs*
 - No
 - Yes
 - How?
 - How long?
 - Separated from other pigs?
 - Separate equipment?
- Specific work wear *observed*
 - Boots
 - Clothes
- Visitors' rules
 - Boot baths
 - Yes
 - No
 - On which occasions do you use it?
 - Prior mechanical cleaning
 - Yes
 - No
 - Preparation eg disinfectants, how often is it prepared/replaced
 - Hand wash
 - Yes
 - No
 - Other rules
 - Special routines for special groups of visitors?

e.g., buyers, training groups, other farmers

- Internal
 - Do you ever move animals within the herd? *e.g., between different pens*
 - When?
 - Why?
 - Which categories of animals?
 - What do you do with sick pigs? *In terms of movement, e.g., move, isolate*
 - What do you do with retarded pigs? *e.g., move, remain and mix with smaller pigs*
 - How do you dispose of dead pigs? *e.g., burry, burn, throw*
 - Do you keep records on sick pigs?
 - Can you identify single pigs? *e.g. ear tags*
- Do you have any wild animals around the farm? Which ones?
- Do you carry out any form of rodent control?
- Dogs or cats roaming?

Herd health management framework - dairy farm



1. Status assessment

1.1 Profile:

Aim: Evaluate herd profile and current inventory of animals.

Execution: Information from the person in charge of daily management and others in the household to ensure different perspectives.

- What type of cows do you keep?
 - Local dairy breeds
 - Crosses of local and exotic dairy breeds
 - Exotic dairy breed
 - Other: _____
- How many cows you keep in the herd today?

Divide into bulls, cows, recruitment heifers and calves
- Who handles the cows?
 - Different people for different tasks? Which tasks (e.g. feeding, watering, milking, treating)?
 - Are children involved in the management?
- What is your main aim of keeping cows?

- Subsistence
- Selling milk and meat
- Other: _____
- Aim/goals/motivation/future plans/improvements of the farmer
 - Are you content with your current production?
 - How would you like to change/improve?
- Other (e.g., is the farm involved in some development program run by government, NGO e.t.c.):

1.2 Productivity/production

Aim: Evaluate general production figures and get an overview of the in- and outflow of animals in the herd.

Execution: Information retrieval from the person in charge of daily management. Note: "number of" is the number of individuals during the past 12 months if nothing else is indicated. Other questions: Give average figures.

- Milk production
 - Average daily production per cow, liters
 - Lactation period length and lactation yield, liters
- Age at first calving, months
- Calving interval, months
- Replacement rate per year
- Reason for slaughter/culling/sale of adult cows?
 - Low milk production
 - Low fertility
 - When money is needed
 - Other: _____

1.3 Health

Aim: Evaluate health issues within the herd past 12 months.

Execution: Divided into what can be observed and what is information retrieved by informant. Observations are carried out by animal health worker according to standardized tests/scales at time of visit. Tick boxes if diseases are/have been prevalent and do follow-up questions and tests if protocol instructs to do so.

Observed (indicate: all animals in the herd / random sample of 15 animals):

- Body condition score
 - o Possible actions if thin:
 - ask about feeding routines
 - check for parasites
 - determine lactation stage
- Udder (palpation + check milk appearance and California Mastitis Test)
 - o If deviating:
 - determine lactation stage
 - take aseptic milk sample for culture
- Coat quality/skin lesions & cleanliness (visual inspection)

Inspect roughness of coat. Check for blisters and skin lesions. Determine fecal or soil contamination on hind body and udder. Note findings.
- Dehydration
- Overall assessment of individual animal, general condition, signs of disease

Information retrieval:

- Reproductive failures last 12 months
 - *If affirmative answers, note quantity of each category respectively*
 - o repeated breeding
 - o early abortions, first half of pregnancy
 - o late abortions, last half of pregnancy

- stillbirths
- Diseases last 12 months

Definition of disease: Sickness that has affected the production or health of the animal(s).

If affirmative response: Note what age group has been most commonly or strongly affected

- Respiratory diseases (nasal discharge, coughing, heavy breathing)
- Diarrhea
- Other gastrointestinal disease (bloating, colic signs, excessive salivation, etc)
- Loss of appetite/depression
- Injuries
- Skin diseases
- Lameness
- Milk fever
- Clinical mastitis
- Vaginal discharge (metritis)
- Neurological signs
- Submandibular edema
- Sudden death
- Other (e.g. knowledge about certain, diagnosed diseases in the farm, IBR, pasteurellosis, BVD, FMD, lumpy skin etc): _____

All disease categories marked on a scale:
No occurrence <-----> common occurrence

- Mortality
 - Young stock:
 - ≤5 days
 - 6 days – 60 days
 - 60 days – slaughter/breeding

- Adults

1.4 Welfare aspects not covered elsewhere

- Do the cows/calves suffer from injuries/wounds?
- Disturbed behavior (*e.g. great fear from humans; stereotypic behaviour*)

2. Practices

2.1 General management

Aim: Evaluate environmental parameters and management practices, including if and what type of records are kept of the herd.

Execution: Combination of observed parameters and information retrieval from the person in charge of daily management.

- Housing premises (including grazing areas, enclosures, indoor housing permanently/ or partly day/night, specific calving pens etc). *Observation, note:*
 - Specify type of housing (stall, open grazing, tethered)
 - Cleanliness of barn area
 - Bedding
 - Crowding
- Water supply & quality
 - How often
 - How much
 - Water source
- Feed supply & quality
 - Type of grazing- if grazed
 - Types of feeds-stall fed
 - Source of feed-home grown/ purchased
 - Type of supplementary feeding
 - What age groups receive supplements and what type?

- Availability of feed
 - During the day
 - Feed management during drought periods?
- Herd structure
 - Mixing of age groups within species
 - Mixing of animal species within the household/village
- Does the farmer keep records (on an individual level) of:
 - Identity markings – *are animals ID-marked, are records kept of IDs*
 - Production – *calves per year per cow, liters of milk, calf weight gain, etc*
 - Reproduction – *male used for mating, date and success of mating, date of calving, calving problems, stillbirths, abortions etc*
 - Health and treatments – *disease occurrences, farmer and veterinary treatments, specific medications*
 - Biosecurity - *Buy/sale log*

2.2 Health monitoring, services and drugs

Aim: Evaluate the knowledge of disease occurrence and handling of diseased animals.

Execution: Information retrieval from the person in charge of daily management.

- How do you determine if an animal is sick?
- What is your course of action when an animal is sick?
 - Treat them yourself, directly consult an animal health worker, other?*
 - Isolation of sick animal?*
- What access do you have to animal health workers/extension services?
 - Do you know their level of education?
- What access do you have to veterinary drugs?
 - What medicines?
 - From where?

- Regarding administration: who can give the medication and how is it administered?
- Deworming routines
 - How often do you deworm?
 - Against what parasite do you deworm?
 - Do you have a known problem with this parasite? How was it diagnosed?
 - What medicine do you use?
- Vaccination routines
 - Which disease do you vaccinate against or what vaccines are you using?
 - How often?
- Other routine treatments?
 - With what/against what?
 - How often?

2.3 Reproductive management (including milking)

Aim: Evaluate management routines specific for reproductive means

Execution: Interview the person in charge of daily management

- Do you perform heat detection?
 - Method used
 - Heifer age (months) at first mating/insemination
 - When are cows cyclic and ready to be mated again after calving?
- Breeding practice
 - Natural breeding
 - Own bull
 - Community bull
 - Other _____
 - AI

- Do you monitor the calving?
- Do you check that the calf gets colostrum?
- Milking intervals
- Milking routines
- Mastitis prevention and control routines

2.4 Biosecurity

Aim: evaluate risk management of disease transmission, both inter- and intraspecies.

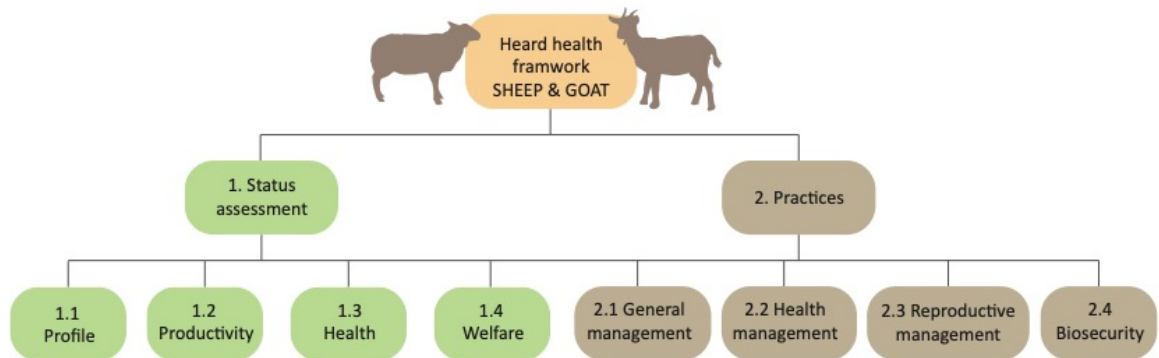
Execution: Interview the person in charge of daily management

- Recruitment practice
 - How do you expand the herd or replace sold/culled animals? - *Own produce/Buying*
 - If new animal: do you have a quarantine routine?
 - Yes/No
 - How is the isolation executed?
 - For how long?
 - Any treatment for isolated animals?
- Sanitary/hygiene practices
 - Cleaning routines of housing premises?
 - Hand wash after handling animals?
 - Cleaning hands and udder before milking?
 - Use of teat dip after milking?
 - Milk utensils/containers, material and hygiene?
 - Milk quality control?
 - Post-harvest milk handling, including transport?
 - Other hygiene aspects:
- Management of calving, placenta, dead calves
 - Use of gloves?

- Destruction? Feed for other animals?
- Disposal of placenta
- Disposal of dead animals
- External biosecurity
 - Does your herd mix with other herds?
 - E.g. due to shared housing, at grazing fields, or at markets
 - Do you restrict contacts between your herd (including the feed) and wildlife? (rodents/birds etc)

Do you restrict contact between your herd (including feed) and dogs/cats?

Herd health management framework - small ruminant farm



1. Status assessment

1.1 Profile:

Aim: Evaluate herd profile and current inventory of animals

Execution: Information from the person in charge of daily management and others in the household to ensure different perspectives

- What type of small ruminants do you keep?
 - Sheep
 - Goats
 - Both
- How many sheep/goats do you keep in the herd today?

Divide into

rams, ewes, first breeding ewes and lambs or

Bucks, does, first breeding does and kids
- Who handles the sheep/goats?
 - Different people for different tasks? Which tasks?
 - Are children involved in the management?
- What is your main aim of keeping the sheep/goats?
 - Subsistence

- Meat
- Milk
- Other:
- Aim/goals/motivation/future plans/improvements of the farmer
 - Are you content with your current production?
 - Would you like to change/improve any area?
- Other (e.g., is the farm involved in some development program run by government, NGO e.t.c.):

1.2 Productivity/production

Aim: Evaluate general production figures to get an overview of the in- and outflow of animals in the herd

Execution: Information retrieval from the person in charge of daily management. Note: "number of" is the number of individuals during the past 12 months if nothing else is indicated. Other questions: Give average figures.

- Number of ewes/does put for the tup
- Number of barren ewes/does
- Age at first lambing/kidding
- Lambing/kidding interval (*months between parities*)
- Number of parities per ewe per/doe per lifetime
- Number of born lambs/kids
 - Number of twin births
- Number of born offspring/female
- Weaning age of lambs/kids
- Growth rate – *if known*
 - Birth weight
 - Weight day 60 (and calculate daily weight gain up to day 60)
 - Weight day 110 (and calculate daily weight gain up to day 110)

- Slaughter weight
- Age at slaughter
- Reason for slaughter/culling/sale?
 - Reached a certain age
 - Reached a certain size/weight
 - Not good for breeding
 - When money is needed
 - Other: _____

If milk production animals:

- Milk production/lactation (litres)
 - Lactation period length and average daily milk production
- Lactation stage at time of visit - days since parturition

1.3 Health

Aim: Evaluate health issues within the herd past 12 months.

Execution: Divided into what can be observed and what is information retrieved by informant. Observations are carried out by animal health worker according to standardized tests/scales at time of visit. Tick boxes if diseases are/have been prevalent and do follow-up questions and tests if protocol instructs to do so.

Observed (indicate: all animals in the herd / random sample of 15 animals):

- Body condition score (palpation)
 - Possible actions if thin:
 - ask about feeding routines
 - check for parasites
 - if ewe/doe: determine lactation stage
- Udder (palpation + check milk appearance and California Mastitis Test)
 - If deviating:
 - determine lactation stage

- take aseptic milk sample for culture
- Dehydration
- Overall assessment of individual animal, general condition, signs of disease

Information retrieval:

- Reproductive failures last 12 months
 - *if affirmative answers, note quantity of each category respectively*
 - repeated breeding
 - early abortions, first half of pregnancy
 - late abortions, last half of pregnancy
 - stillbirths

- Diseases last 12 months

Definition of disease: Sickness that has affected the production or health of the animal(s)

If affirmative response: Note what age group has been most commonly or strongly affected

- Respiratory diseases (nasal discharge, coughing, heavy breathing)
- Diarrhea
- Other gastrointestinal disease (bloating, colic signs, excessive salivation, etc)
- Inappetence/depression
- Injuries
- Lameness
- Clinical mastitis
- Vaginal discharge (metritis)
- Neurological signs
- Submandibular edema
- Sudden death

All disease categories marked on a scale:
No occurrence <-----> common occurrence

- Other: _____
- Mortality
 - Young stock:
 - ≤5 days
 - 6 days – 60 days
 - 60 days – slaughter/breeding
 - Adults

1.4 Welfare aspects not covered elsewhere

- Do the sheep/goats have injuries/wounds?
- Coat quality/skin lesions & cleanliness (visual inspection)

Inspect roughness of coat. Check for blisters and skin lesions. Determine fecal or soil contamination (international scale for this?). Note findings.
- Disturbed behavior (e.g. great fear from humans; stereotypic behaviour)

2. Practices

2.1 General management

Aim: Evaluate environmental parameters and management practices, including if and what type of records are kept of the herd.

Execution: Combination of observed parameters and information retrieval from the person in charge of daily management.

- Housing premises (including grazing areas, enclosures, indoor housing permanently/ or partly day/night, indoor at lambing, specific lambing pens etc). *Observation, note:*
 - Specify type of housing (free roaming, enclosures, tethering)
 - Cleanliness of environment
 - Bedding
 - Crowding

- Water supply & quality
 - How often
 - How much
 - Water source
- Feed supply & quality
 - Type of grazing
 - Type of supplementary feeding
 - What age groups receive supplements and what type?
 - Availability of feed
 - Feed management during drought periods?
- Herd structure
 - Mixing of age groups within species
 - Mixing of sexes within species
 - Mixing of animal species within the household/village
- Do the farmer keep records (on an individual level) of:
 - Identity markings – *are animals ID-marked, are records kept of IDs*
 - Production - *number of lambs, liters of milk, weight gain, etc*
 - Reproduction – *male used for mating, number of offspring/females, date and success of mating, date of lambing/kidding, parturition problems, stillbirths, abortions etc*
 - Health and treatments – *disease occurrences, treatments, specific medications*
 - Biosecurity - *Buy/sale log*

2.2 Health monitoring, services and drugs

Aim: Evaluate the knowledge of disease occurrence and handling of diseased animals

Execution: Information retrieval from the person in charge of daily management

- How do you determine if an animal is sick?
- What is your course of action when an animal is sick?
 - Treat them yourself, directly consult an animal health worker, other?*
 - Isolation of sick animal?*
- What access do you have to animal health workers/extension services?
 - Do you know their level of education?
- What access do you have to veterinary drugs?
 - What medicines?
 - From where?
 - Regarding administration: who can give the medication and how is it administered?
- Deworming routines
 - How often do you deworm?
 - Against what parasite do you deworm?
 - Do you have a known problem with this parasite? How was it diagnosed?
 - What medicine do you use?
- Vaccination routines
 - Which disease do you vaccinate against or what vaccines are you using?
 - How often?
- Other routine treatments?
 - With what/against what?
 - How often?

2.3 Reproductive management

Aim: Evaluate management routines specific for reproductive means

Execution: Interview the person in charge of daily management

- Do you detect when your ewe/doe comes into heat/is willing to mate?
 - How old are ewes/does at first mating?
 - When are they cyclic and ready to be mated again after lambing/kidding?
- Do you practice planned mating during a specific period?
 - Yes/No
 - Why? – Lambs delivered in good feed season, to let ewe/doe recover between pregnancies, etc
- Breeding practice
 - Natural breeding
 - Own ram
 - Community ram
 - Other _____
 - AI
- Do you monitor the lambing/kidding?
- What weaning practice do you use?
 - Natural/Separation of mother and offspring
 - General age for weaning:
- Castration of unwanted male animals?

2.4 Biosecurity

Aim: evaluate risk management of disease transmission, both inter- and intraspecies.

Execution: Interview the person in charge of daily management

- Recruitment practice
 - How do you expand the herd or replace sold/culled animals? - *Own produce/Buying*
 - If new animal: do you have a quarantine routine?
 - Yes/No
 - How is the isolation executed?
 - For how long?
 - Any treatment for isolated animals?
- Sanitary / hygiene practices
 - Cleaning routines of housing premises?
 - Hand wash after handling animals?
 - Other hygiene aspects:
- Management of placenta and dead lambs/kids
 - Use of gloves when handling?
 - Destruction? Feed for other animals?
- External biosecurity
 - Does your herd mix with other herds?
 - E.g., due to shared housing, at grazing fields, or at markets
 - Do you restrict contacts between your herd (including the feed) and wildlife? (rodents/birds e.t.c.)
 - Do you restrict contact between your herd (including feed) and dogs/cats?

Health plans and actions

Farm name:

Plan determined in agreement between (names):

Identified focus areas, based on the herd assessment:

- 1.
- 2.

Time plan

FOCUS AREA 1				
Aim	Action	Goal Date	Responsible	Comment

FOCUS AREA 2				
Aim	Action	Goal Date	Responsible	Comment

Follow up	1	2	3	4	5
Date					
Activity					
Responsible					
Follow up					

Important conditions or causalities for success:

Economic potential of set goals:

Date and signatures: