

# ANIMAL HEALTH COMPLETE GUIDANCE FOR INTENSIVE SYSTEMS (MONOGASTRICS & RUMINANTS)

Highly specialized systems found mostly in middle-to high-income countries. Common features include high productivity animals, industrial management, and sourcing of feed produced off-farm.



This document provides the complete Animal Health Guidance for Intensive Systems (Monogastrics & Ruminants) systems as part of the Investing in Sustainable Livestock (ISL) Guide.



# **ANIMAL HEALTH COMPLETE GUIDANCE FOR INTENSIVE SYSTEMS (MONOGASTRICS & RUMINANTS)**

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The online ISL Guide ([www.sustainablelivestockguide.org](http://www.sustainablelivestockguide.org)) is an information resource and interactive platform for designing and implementing sustainable livestock development projects. The guide's interactive component provides context-specific guidance, suggested activities, and indicators to help livestock projects contribute to sustainable development outcomes; it also includes references for further investigation.

# ANIMAL HEALTH COMPLETE GUIDANCE FOR INTENSIVE SYSTEMS (MONOGASTRICS & RUMINANTS)

## Introduction to the ISL Guide

The ISL Guide is grounded in tested theory and evidence organized into 12 principles for sustainability in the livestock sector (the Theory Behind the Guide). These principles serve as a framework for assessing the sustainable performance of livestock production systems as well as opportunities for livestock to contribute to sustainability outcomes (see table below). The principles have relevance for project conceptualization (Principle 1), technical project design (Principles 2 through 6), and the broader socio-cultural, political, and economic context in which the project will be implemented (Principle 7).

The ISL Guide takes into consideration a variety of geographic contexts and tailors its guidance to different project objectives and interventions. So, if you are designing or implementing a project that involves livestock, it has detailed recommendations for you. Since the ISL Guide understands sustainability in a broad sense, it will eventually comprise elements not only relating to the environment and animal health and welfare, but also to equity issues such as gender and inclusion. The World Bank and FAO will expand the guide to integrate these issues in due course.

<b>PRINCIPLE 1</b>	
Contribute to a Sustainable Food Future	
<b>ENVIRONMENT GUIDE</b>	<b>ANIMAL HEALTH GUIDE</b>
<b>PRINCIPLE 2</b>	<b>PRINCIPLE 2</b>
Enhance Carbon Stocks	Prevent & Control Animal Diseases
<b>PRINCIPLE 3</b>	<b>PRINCIPLE 3</b>
Improve Efficiency at Animal & Herd Levels	Ensure the Welfare of Animals
<b>PRINCIPLE 4</b>	<b>PRINCIPLE 4</b>
Source Feed Sustainability	Healthy Animals for Safer Food
<b>PRINCIPLE 5</b>	<b>PRINCIPLE 5</b>
Couple Livestock to Land	Reduce Risk of Zoonosis
<b>PRINCIPLE 6</b>	<b>PRINCIPLE 6</b>
Minimize Fossil Fuel Use	Prudent & Responsible Use of Antimicrobials
<b>PRINCIPLE 7</b>	
Foster an Enabling Environment	



# Structure of the ISL Guide



The ISL Guide provides technical guidance for improving the sustainability outcomes of livestock projects in the following 6 contexts, which cover the different livestock farming systems found worldwide:

- Grazing Dry - Pastoral (Ruminants)
- Grazing Temperate (Ruminants)
- Grazing Sub-Humid (Ruminants)
- Mixed Crop-Livestock, Dry (Ruminants)
- Mixed Crop-Livestock, Humid (Monogastrics)
- Intensive (Ruminants and Monogastrics)

The guidance provided for each of these contexts is organized according to objectives that are typically

found in livestock investment projects (see Process). Each objective is tied to a series of interventions. Those common objectives are:

- Improve the Productivity of Livestock
- Improve Market Access and Develop Value Chains
- Improve Input and Service Delivery
- Climate Change Resilience and Emergency Response
- Strengthen Policies, Knowledge and Information

For every combination of objective and intervention, the ISL Guide provides context-specific guidance for improving the sustainable outcomes, as well as suggested indicators for project monitoring and evaluation.

# Overview of Intensive Systems (Monogastrics & Ruminants)

This context covers highly specialized systems found mostly in middle-to high-income countries. Common features include high productivity animals, industrial management, and sourcing of feed produced off-farm.

## DESCRIPTION OF TYPICAL SITUATION

Industrial livestock production systems are characterized by their relatively large scale, a high level of specialization, limited direct land use, reliance on off-farm production of feeds and other inputs, and use of high-producing breeds. Pig and poultry are the predominant species found in these systems, but dairy and beef may also be reared in such settings. Industrial, or large-scale intensive livestock production systems are found all over the world, although mostly in middle-to high-income countries, where their development took place in response to high demand, well-developed infrastructure (making transport and processing of inputs and outputs feasible), and a relative scarcity of land.

These systems are also the most rapidly growing form of animal production, accounting for more than 60% of the world's pork production and more than 85% of the world's poultry meat production. Regarding pork, the major production regions are East and Southeast Asia, Western Europe, and the United States. China alone produces almost half of the world's pork.

Industrial pig and poultry production systems evolved from more circular forms of production, such as backyard systems where livestock scavenged for feed, or feed was supplemented with kitchen wastes and locally available food processing residues. Scaling up of such backyard systems, driven by demand for meat products and/or pressure on land, is often not a gradual process. When the number of pigs or poultry on a farm or in a geographical location increases rapidly, this results in a growing demand of inputs. The outcomes of this are often feeds sourced externally, and infrastructure such as housing required to control the production environment and avoid predation and pests. This may lead to livestock health issues because of the high

concentration of animals, and the local community may complain because of odor, water and air pollution, and animal welfare perceptions. This results in the need for sophisticated buildings and equipment, thus in higher production costs, which are generally offset by strong economies of scale. Consequently, pig and poultry production is generally found either as backyard systems or as medium- to large-scale industrial systems without much space for intermediary systems. In most low- to middle-income countries, backyard pig and poultry production is an important contributor to monogastric meat production. For example, backyard systems contribute about one-third to China's pork production and are the major supplier of pork to Vietnam.

## COMMON ANIMAL HEALTH ISSUES

In the livestock intensive production systems, there is little regard for the animal's natural behaviors or needs. Although prohibited in some places, poor practices remain prevalent elsewhere. For example, birds' beaks are often cut off to prevent them from pecking each other and tails of cows and pigs are amputated (called docking). Animal behaviors, like pigs rooting in the soil or chickens taking dust baths, are stifled when animals live in cages or in houses with concrete or slatted floors. (Principle 3)

In extreme cases, animals are raised on top of their own excrement, breathing poor air quality with high levels of dust, aerosol particles and gaseous ammonia, and are under continued stress due to overcrowded housing, predisposing them to respiratory conditions. Furthermore, due to their close living quarters, lack of clean areas, and weakened immune systems from lack of exercise and nutrition, animals are more susceptible to disease. Although antibiotics were originally used to treat infections from various pathogens, they are also used improperly to prevent infections, and as additives for feed and biocides for growth promotion. Given the density of animals, good animal husbandry practices, biosecurity, and vaccinations are needed in these farming systems – unfortunately this is often compensated by the excessive use of antimicrobials –

## ANIMAL HEALTH COMPLETE GUIDANCE FOR INTENSIVE SYSTEMS (MONOGASTRICS & RUMINANTS)

driving AMR. Therefore, special attention is needed for the proper, prudent use of antimicrobials and protect against antimicrobial resistance. (Principle 6)

In medium to large-scale operations, the lack of sufficient biosecurity measures, particularly in terms of contact between wild and domestic animals, presents potential for inter-species pathogen spillover and potentially livestock and zoonotic disease outbreaks. The first emergence of Nipah virus is one example, with emergence resulting from bat-pig contact, likely via bat-contaminated fruit. Limiting wild-domestic animal contact through measures such as enhanced animal housing, avoiding fruit orchards that attract wildlife near livestock operations, and avoiding placement of rearing operations in wildlife habitats are possible approaches to reduce risk. (Principle 2, 5)

Foodborne illnesses are usually infectious or toxic in nature and caused by bacteria, viruses, parasites or chemical substances entering the body through contaminated food or water. Examples of foods involved in outbreaks of salmonellosis are eggs, poultry and other products of animal origin. Foodborne cases with *Campylobacter* are mainly caused by consumption of raw milk, raw or undercooked poultry, and drinking water. Proper diets and nutrition can be key in both maintaining livestock health as well as contributing to food safety. For example, cattle are natural reservoirs for pathogenic *E. coli*, and cattle fed mostly grain have been shown to have lower colonic pH, meaning they are more acidic, thus creating an ideal environment for increased numbers of acid-resistant *E. coli* compared to cattle fed only hay. (Principle 4)

### REFERENCES:

**Diaz-Gonzalez F, Callaway TR, Kizoulis MG, Russell JB.** Grain feeding and the dissemination of acid-resistant *Escherichia coli* from cattle. *Science*. 1998;281(5383):1666-1668. doi:10.1126/science.281.5383.1666

**Hovde CJ, Austin PR, Cloud KA, Williams CJ, Hunt CW.** Effect of cattle diet on *Escherichia coli* O157:H7 acid resistance. *Appl Environ Microbiol*. 1999;65(7):3233-3235.

**American Society for the Prevention of Cruelty to Animals.** "A Closer Look at Animals on Factory Farms." ASPCA (n.d.) Retrieved March 7, 2019, from <https://www.asPCA.org/fight-cruelty/farm-animal-cruelty/pigs-factory-farms>

**OIE, 2020.** About Food Safety. Access on line: <https://www.oie.int/en/food-safety/animal-production-food-safety/>

# OBJECTIVE 1: IMPROVE PRODUCTIVITY OF LIVESTOCK

## INTERVENTION: Feed resources and balance

### ACTIVITIES

- Develop on-farm feed resources.
- Source (ingredients for) concentrate feed.
- Improve feed ration balancing.
- Extend stall-feeding.

### GUIDANCE

#### P2 | P3

Improved feed availability and quality may not only increase animal productivity but also incentivize increases in herd size. These activities should be followed by an evaluation of the potential implications of any expected increase in animal numbers on animal health and welfare, such as overcrowding or lack of veterinary care and supplies.

#### P2 | P4 | P5

Certain changes in feeding practices, such as moving to stall-feeding systems might affect husbandry practices and contribute to the occurrence/worsening of animal disease and zoonoses. Therefore, it is important that any changes in feeding system are accompanied by adequate training in best practices for husbandry and disease monitoring.

### INDICATORS

Livestock production units that have adopted an Animal Welfare management plan – Number/proportion  
This indicator measures the number of livestock units, slaughterhouses, dairies and other processing units; animal gathering points; and markets that have received project support and developed and implemented animal welfare management plans. As a minimum, plans should address the Five Freedoms: freedom from hunger and thirst; freedom from discomfort; freedom from pain, injury, or disease; freedom to express normal behavior;

and freedom from fear and distress. This indicator should be broken down by farm size, species and type of farm, where possible.

- ➔ Reported annually using project advancement reports

#### Farmers/extension agents/service providers— Number

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

- ➔ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

#### Data management and information system developed – Yes/No or on a scale from 0-4

This indicator measures the ability to generate or compile, analyze and disseminate data in ways that serve to define health strategies, review results or endorse the status of a country. Establishment of fully functional systems can be reported as “Yes/No”, or scaled in levels, for example, level 0 if no system is in place; level I if data is only collected and compiled; level II if this data is analysed; level III if outputs are disseminated adequately; or level IV if overall quality control is included.

- ➔ Reported annually using project advancement reports.

OBJECTIVE 1:  
**IMPROVE THE PRODUCTIVITY  
OF LIVESTOCK**

## INTERVENTION: **Animal health and welfare**

### ACTIVITIES

- Undertake vaccination campaigns.
- Improve disease early detection, prevention and control.
- Avoid spread of antimicrobial resistance (AMR).
- Improve livestock welfare.

### GUIDANCE

#### P2 | P5

Disease programs should include plans for emergency preparedness, prevention, control and eradication, and surveillance, according to risk assessment.

#### P2 | P4 | P5

Vaccination campaigns should promote adequate selection of the vaccine type, pathogen match and source, and account for chain distribution according to the speciation of the product (e.g. food chain) (OIE, 2020).

#### P2 | P4 | P5

Disease programs require an appropriate disease and livestock information system that includes traceability.

#### P2 | P7

When culling animals for disease prevention and control, incentives for notification and compensation should be developed to support disease programs (FAO, 2013; OECD, 2012).

#### P3 | P6

In order to promote sustainability, farmer awareness programs should accompany these activities. Such programs should cover the animal and public health impacts and economic consequences of the inappropriate use of antimicrobials; the need to record the use of antimicrobials for monitoring purposes; and the benefits of improving livestock health and welfare (World Bank, 2019; World Bank, 2017; WHO 2016; OIE 2020).

### INDICATORS

#### **Animal diseases control program— Number**

This indicator measures the number of programs developed and funded for the control and eradication of pertinent animal diseases. Such programs reflect a shortlist of target diseases at the regional or national level and are based on analysis of risk and country priorities.

- ➔ Reported annually using project advancement reports.

#### **Data management and information system developed – Yes/No or on a scale from 0-4**

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- ➔ Reported annually using project advancement reports

#### **Contingency fund for livestock emergencies created and operational – Yes/No**

This indicator measures the creation of a contingency fund for livestock emergencies related to drought, disease, and other hazards. Establishing such a fund requires well-documented contingency action plans for specific, high-priority, emergency diseases, together with a series of generic plans for activities or programs common to these plans (e.g. setting up national and local animal disease control centers). These also need to have resource and financial plans and appropriate legislative backing for all actions. In addition, contingency plans need to be considered and agreed upon in advance by all major stakeholders, including the political and bureaucratic arms of government and the private sector, particularly livestock farmer organizations.



## OBJECTIVE 1: IMPROVE THE PRODUCTIVITY OF LIVESTOCK

Plans should be refined through simulation exercises and personnel should be trained in their individual roles and responsibilities.

→ Reported annually using project advancement reports.

### **Farmers/extension agents/service providers— Number**

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

→ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

### **Disease early warning system and emergency preparedness in place— Yes/No**

This indicator measures the creation of an early warning system that builds on the added value of combining and coordinating cross-sectorial alert mechanisms between relevant government ministries, including protocols and a chain of command. It refers to the surveillance system and alert and response strategy to face emerging diseases, including zoonotic diseases, for which a contingency plan should be implemented, widely known across relevant stakeholder, rehearsed, for example, through simulation exercises. This indicator also measures the improved resilience of pastoralists by enabling destocking, redistribution, or other actions to avoid the loss of livestock value in the event of a crisis.

This indicator can be rated according to the level of development and implementation. Level I would indicate that there is a strategy for developing a disease early warning system and an emergency preparedness plan; level II would indicate that the strategy has been implemented; and level III would indicate that the strategy has been trialed.

→ Reported annually using project advancement reports

## INTERVENTION: Animal genetics

### ACTIVITIES

• Select for improved genetics within the existing herd.

### GUIDANCE

#### P2 | P3 | P1 | P7

Choosing genetic diversity and the adequacy of the breed, race or strains could better prevent and control animal diseases and adaptation of the animals to the environment, weather and to optimize water and feed consumption.

### INDICATORS

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#### **Livestock production units that have adopted an Animal Welfare management plan — Number/ proportion**

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## OBJECTIVE 1: IMPROVE THE PRODUCTIVITY OF LIVESTOCK

and freedom from fear and distress. This indicator should be broken down by farm size, species and type of farm, where possible.

→ Reported annually using project advancement reports.

### **Data management and information system developed – Yes/No or on a scale from 0-4**

This indicator measures the ability to generate or compile, analyze and disseminate data in ways that serve to define health strategies, review results or endorse the status of a country. Establishment of fully functional systems can be reported as “Yes/No”, or scaled in levels, for example, level 0 if no system is in place; level I if data is only collected and compiled; level II if this data is analysed; level III if outputs are disseminated adequately; or level IV if overall quality control is included.

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OBJECTIVE 1

OBJECTIVE 2

OBJECTIVE 3

OBJECTIVE 4

OBJECTIVE 5

OBJECTIVE 6

## OBJECTIVE 2: IMPROVE MARKET ACCESS AND DEVELOP VALUE CHAINS

### INTERVENTION: Producer organizations and alliances.

#### ACTIVITIES

- Establish and/or build the capacity of new/existing producer organizations.
- Provide financing for subprojects under productive alliances.

#### GUIDANCE

##### P3 | P4 | P6

The opportunity should be taken to raise awareness amongst producer organizations about issues related to livestock systems, including food safety, animal welfare, and antimicrobial resistance (FAO, 2016; FAO, 2020).

##### P2 | P7

Training on developing management plans for animal diseases should be provided to producers and producer organizations.

##### P3 | P4 | P5 | P7

Include One Health criteria in project selection activities, for example, antimicrobial resistance management between feed producers and farmers (OIE, 2008; Gall et al., 2018; WHO, 2016; OIE, 2020).

#### INDICATORS

##### Farmers/extension agents/service providers— Number

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received,

differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

- ➔ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation

##### Coordination mechanisms under the One Health approach – Number

This indicator measures the number of coordination mechanisms implemented by governments that explicitly include the concept of One Health and which aim to be intersectoral across public health, human health and environment. This indicator can also include initiatives from the private sector.

- ➔ Reported annually using project advancement reports.

### INTERVENTION: Post-farm gate facilities

#### ACTIVITIES

- Construct and/or upgrade roads between production, processing, and market areas.
- Improve transport and storage capacity.
- Construct and/or upgrade processing plants, slaughterhouses, dairy processing, and (wet or wholesale) markets.

#### GUIDANCE

##### P2

Foster systems for data collection, monitoring and traceability, to enable the implementation of checkpoints.

## OBJECTIVE 2: IMPROVE MARKET ACCESS AND DEVELOP VALUE CHAINS

### P2

Ensure that proper quarantine facilities are built where necessary and according to risk assessments. Ideally, these should be linked to major country livestock accesses and in livestock gathering facilities (e.g., markets).

### P2 | P3

Promote the development and distribution of guidelines for livestock health and welfare during transport (OIE, 2020; FAO, 2001).

### P4

Consult with food safety specialists to ensure any processing plant, slaughterhouse construction or market to meet the food safety standards.

### P5

Contact should be established with public health and environment agencies to support development of an integrated information system for the One health approach (Gall et al., 2018).

## INDICATORS

### Data management and information system developed – Yes/No or on a scale from 0-4

This indicator measures the ability to generate or compile, analyze and disseminate data in ways that serve to define health strategies, review results or endorse the status of a country. Establishment of fully functional systems can be reported as “Yes/No”, or scaled in levels, for example, level 0 if no system is in place; level I if data is only collected and compiled; level II if this data is analysed; level III if outputs are disseminated adequately; or level IV if overall quality control is included.

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### Farmers/extension agents/service providers— Number

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received,

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→ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

### Coordination mechanisms under the One Health approach – Number

This indicator measures the number of coordination mechanisms implemented by governments that explicitly include the concept of One Health and which aim to be intersectoral across public health, human health and environment. This indicator can also include initiatives from the private sector.

→ Reported annually using project advancement reports

## INTERVENTION: Value chain opportunities

### ACTIVITIES

- Raise awareness among consumers of products produced under the project.
- Establish livestock market information systems and support livestock trade associations to access import and export markets.

### GUIDANCE

#### P2 | P4

Foster systems for data collection, monitoring and traceability.

#### P4 | P5

The opportunity should be taken to raise the awareness of farmers about food safety measures, good farming practices, and biosecurity, to reduce the risk of animal diseases and zoonoses (OIE-FAO, 2009).

### INDICATORS

### Data management and information system developed – Yes/No or on a scale from 0-4

This indicator measures the ability to generate or compile, analyze and disseminate data in ways that

## OBJECTIVE 2: IMPROVE MARKET ACCESS AND DEVELOP VALUE CHAINS

serve to define health strategies, review results or endorse the status of a country. Establishment of fully functional systems can be reported as “Yes/No”, or scaled in levels, for example, level 0 if no system is in place; level I if data is only collected and compiled; level II if this data is analysed; level III if outputs are disseminated adequately; or level IV if overall quality control is included.

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➔ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

### Livestock production units that have adopted Good Animal Husbandry Practices (GAHP)— Percentage

This indicator measures the percentage of livestock units that have implemented GAHPs. It should be broken down by farm size, species and type of farm, where possible.

➔ Reported annually using project advancement reports.

## INTERVENTION: Develop livestock fattening activities

### ACTIVITIES

- Undertake territorial planning to identify and develop reproductive regions (drier) and fattening regions (wetter).
- Develop transportation networks to transport livestock to and from fattening areas.
- Optimize the offtake rate (the proportion of the herd that is sold or consumed each year).
- Create a market demand for products of fattening activities.

### GUIDANCE

#### P2 | P5

Foster systems for data collection, monitoring and traceability.

#### P2 | P3

Promote the development and distribution of guidelines for livestock health and welfare during transport (OIE, 2020; FAO, 2001).

### INDICATORS

#### Data management and information system developed — Yes/No or on a scale from 0-4

This indicator measures the ability to generate or compile, analyze and disseminate data in ways that serve to define health strategies, review results or endorse the status of a country. Establishment of fully functional systems can be reported as “Yes/No”, or scaled in levels, for example, level 0 if no system is in place; level I if data is only collected and compiled; level II if this data is analysed; level III if outputs are disseminated adequately; or level IV if overall quality control is included.

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OBJECTIVE 1

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## OBJECTIVE 2: IMPROVE MARKET ACCESS AND DEVELOP VALUE CHAINS

### **Farmers/extension agents/service providers— Number**

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

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## OBJECTIVE 3: IMPROVE INPUT AND SERVICES DELIVERY

### INTERVENTION: Develop public and private extension services

#### ACTIVITIES

- Provide extension agents with training and capacity building.
- Develop extension manuals and curricula (In coordination and collaboration with university, vocational school and extension stations).

#### GUIDANCE

##### P2 | P3

Put emphasis on the training of extension agents to evaluate and advise herders on disease recognition and notification, herd movement, and the Five Freedoms.

#### INDICATORS

##### Farmers/extension agents/service providers— Number

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

- ➔ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

### INTERVENTION: Improve public and private animal health services

#### ACTIVITIES

- Provide veterinarians and livestock health workers with training and capacity building.
- Provide/enhance official veterinary services with data system for collection, monitoring, analysis and risk assessment
- Provide/enhance infrastructure and equipment of veterinary services, including quarantine facilities and port/harbor checking points
- Provide/enhance Laboratory capacity to support VS activities
- Develop simulation exercises for emergency planning and preparedness
- Develop veterinary and livestock health manuals, SOPs and curricula.

#### GUIDANCE

##### P2 | P7

Where available, use OIE PVS reports, including those on legislation and gap analysis, to assess the need for training, analytical work, capacity building and infrastructure (OIE, 2020; OIE, 2019).

##### P6

During training, raise awareness among veterinarians and livestock health workers about antimicrobial resistance and animal welfare, and their links to livestock health.

##### P2 | P4 | P5 | P7

Where possible, provide the option of an integrated health system with the public sector (the One Health approach) and other relevant government ministries (e.g., communication, environment, etc.), particularly during simulation exercises (OIE, 2008; Gall et al., 2018).

## OBJECTIVE 3: IMPROVE INPUT AND SERVICES DELIVERY

### P2

Explore the option of integrating private sector databases and information systems with public ones.

### P2 | P5 | P6

Establish bridges to integrate private laboratories into the official network by establishing minimum performance standards and a quality control system (such as a proficiency ring laboratory exercise)

## INDICATORS

### Farmers/extension agents/service providers— Number

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

→ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

### Veterinarians/paraprofessionals trained on animal health issues and options in the livestock sector — Number

This indicator measures the number of veterinarian/paraprofessionals along supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, and capacity development programs. The indicator should also break down the kinds of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, in-depth courses.

→ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

### Coordination mechanisms under the One Health approach — Number

This indicator measures the number of coordination mechanisms implemented by governments that explicitly include the concept of One Health and which aim to be intersectoral across public health, human health and environment. This indicator can also include initiatives from the private sector.

→ Reported annually using project advancement reports.

### New regulations adopted— Number of regulations

This indicator measures the number of new regulations adopted or amended to effectively support the activities of relevant fields, such as controlling transboundary and emerging zoonotic and animal diseases; ensuring food safety; and controlling AMR. Tools such as the World Organisation for Animal Health’s Performance of Veterinary Services Pathway (known as the OIE PVS Pathway) can be used to define the baseline and gaps, particularly the Veterinary Legislation Support Programme.

→ Reported annually using project advancement reports.

## INTERVENTION: Strengthen provision of input and services

### ACTIVITIES

- Provide private service and input providers with training and seed financing.
- Foster the development of new services where gaps exist.

### GUIDANCE

#### P2 | P7

When available, use OIE PVS Reports, including Legislation and GAP Analysis, to assess the need for training and financing (OIE, 2020).

#### P7

Put emphasis on developing markets for sustainable inputs, such as sustainably-sourced feed, organic fertilizers, and organic pesticides.

## OBJECTIVE 3: IMPROVE INPUT AND SERVICES DELIVERY

### INDICATORS

#### **Farmers/extension agents/service providers– Number**

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

- ➔ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

#### **Livestock production units that have adopted Good Animal Husbandry Practices (GAHP)– Percentage**

This indicator measures the percentage of livestock units that have implemented GAHPs. It should be broken down by farm size, species and type of farm, where possible.

- ➔ Reported annually using project advancement reports.

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## OBJECTIVE 4:

# CLIMATE CHANGE RESILIENCE AND EMERGENCY RESPONSE

## INTERVENTION:

### Improve manure, nutrients, and waste management

#### ACTIVITIES

- Improve integrated manure management in areas where livestock is concentrated.
- Develop territorial approaches to improving the nutrient balance.

#### GUIDANCE

##### P6

Consider effective treatment of wastes to reduce and eliminate residual antimicrobials and pathogens.

#### INDICATORS

##### Farmers/extension agents/service providers— Number

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

- ➔ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

##### Livestock production units that have adopted an antimicrobial resistance (AMR) management plan — Number/proportion

This indicator measures the number of livestock production units with AMR management plans that have the objective of decreasing antimicrobial use in animals (measured in kilograms per livestock

production unit per year). Management plans should include improving hygiene, and improving wastewater and sludge management in food production, under the One Health approach. National monitoring systems for antimicrobial use can also be used as indicators, in line with antimicrobial surveillance and monitoring capacity .

- ➔ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation,

##### Coordination mechanisms under the One Health approach — Number

This indicator measures the number of coordination mechanisms implemented by governments that explicitly include the concept of One Health and which aim to be intersectoral across public health, human health and environment. This indicator can also include initiatives from the private sector.

- ➔ Reported annually using project advancement reports.

## INTERVENTION:

### Develop early warning information systems and feed budgeting

#### ACTIVITIES

- Strengthen early warning systems in remote pastoral areas.
- Develop pastoral crisis response plans.
- Develop seasonal assessments to forecast potential crises.

#### GUIDANCE

##### P2 | P7

Harmonize early warning information systems with information systems on livestock, climate, and weather. Harness systems to monitor and evaluate animal



## OBJECTIVE 4: CLIMATE CHANGE RESILIENCE AND EMERGENCY RESPONSE

disease management in pastoral areas. Harmonizing livestock, climate, weather, and early warning information systems can improve the resilience of pastoralists by enabling destocking, redistribution, or other actions to avoid loss of livestock value in times of crisis.

### P7

Include basic animal disease management practices in training and capacity-building programs on pastoral crisis management planning (LEGS, 2009).

### INDICATORS

#### **Disease early warning system and emergency preparedness in place— Yes/No**

This indicator measures the creation of an early warning system that builds on the added value of combining and coordinating cross-sectorial alert mechanisms between relevant government ministries, including protocols and a chain of command. It refers to the surveillance system and alert and response strategy to face emerging diseases, including zoonotic diseases, for which a contingency plan should be implemented, widely known across relevant stakeholder, rehearsed, for example, through simulation exercises. This indicator also measures the improved resilience of pastoralists by enabling destocking, redistribution, or other actions to avoid the loss of livestock value in the event of a crisis.

This indicator can be rated according to the level of development and implementation. Level I would indicate that there is a strategy for developing a disease early warning system and an emergency preparedness plan; level II would indicate that the strategy has been implemented; and level III would indicate that the strategy has been trialed.

→ Reported annually using project advancement reports.

#### **Contingency fund for livestock emergencies created and operational – Yes/No**

This indicator measures the creation of a contingency fund for livestock emergencies related to drought, disease, and other hazards. Establishing such a fund requires well-documented contingency action plans for specific, high-priority, emergency diseases, together with a series of generic plans for activities or programs common to these plans (e.g. setting up

national and local animal disease control centers). These also need to have resource and financial plans and appropriate legislative backing for all actions. In addition, contingency plans need to be considered and agreed upon in advance by all major stakeholders, including the political and bureaucratic arms of government and the private sector, particularly livestock farmer organizations. Plans should be refined through simulation exercises and personnel should be trained in their individual roles and responsibilities.

→ Reported annually using project advancement reports.

#### **Farmers/extension agents/service providers— Number**

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

→ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

#### **Livestock production units that have adopted Good Animal Husbandry Practices (GAHP)— Percentage**

This indicator measures the percentage of livestock units that have implemented GAHPs. It should be broken down by farm size, species and type of farm, where possible.

→ Reported annually using project advancement reports.

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## OBJECTIVE 5: **STRENGTHEN POLICIES, KNOWLEDGE, AND INFORMATION**

### INTERVENTION: **Develop and harmonize livestock policies, plans, regulations, and programs**

#### ACTIVITIES

- Develop a national livestock master plan.
- Establish regulations for the zoning of livestock grazing and mobility (transhumance) areas.
- Improve equity of grazing and water use rights within pastoralist communities.
- Pilot programs to enable pastoralists to access donor and other multinational financing.

#### GUIDANCE

##### P2 | P3 | P4 | P5 | P6

A national livestock master plan should include activities to address animal diseases, animal welfare, food safety, zoonosis and antimicrobial resistance.

##### P7

Where available, use the OIE PVS reports, including those relating to legislation and gap analysis to assess relevant gaps (OIE, 2019).

#### INDICATORS

##### **National livestock strategies developed and endorsed— On a scale from 0-2**

This indicator measures the creation of a national livestock strategy. Such a strategy includes protocols and standard operating procedures to define national priorities for animal health and welfare that can sustainably increase livestock productivity and achieve diversification, commercialization and competitiveness of the livestock subsector. The indicator reflects whether such a strategy is absent (0) or developed and endorsed at sub-national level (1) or national level (2).

- ➔ Reported annually using project advancement reports.

##### **New regulations adopted— Number of regulations**

This indicator measures the number of new regulations adopted or amended to effectively support the activities of relevant fields, such as controlling transboundary and emerging zoonotic and animal diseases; ensuring food safety; and controlling AMR. Tools such as the World Organisation for Animal Health's Performance of Veterinary Services Pathway (known as the OIE PVS Pathway) can be used to define the baseline and gaps, particularly the Veterinary Legislation Support Programme.

- ➔ Reported annually using project advancement reports.

##### **Pastoralists with ongoing, financed projects — Number of projects**

This indicator measures the numbers of pilot projects that enable pastoralists to access donor and other multinational financing, as well as other financed projects to improve equity relating to grazing and water-use rights within pastoralist communities.

- ➔ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

### INTERVENTION: **Develop livestock information systems**

#### ACTIVITIES

- Develop animal identification, traceability and performance recording.
- Include livestock data in the agriculture census.

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## OBJECTIVE 5: STRENGTHEN POLICIES, KNOWLEDGE, AND INFORMATION

### GUIDANCE

#### P3 | P6

Include data on the use of antimicrobials, and animal welfare indicators, in livestock information systems.

#### P2 | P4

Include data on animal diseases and treatment, including for zoonosis.

#### P2 | P7

Include training and resources for the collection of data that enable disease risk assessment, including information on the transport of animals.

#### P7

Make provisions for training on the use of the information system, including epidemiological surveillance and risk assessment.

### INDICATORS

#### Data management and information system developed – Yes/No or on a scale from 0-4

This indicator measures the ability to generate or compile, analyze and disseminate data in ways that serve to define health strategies, review results or endorse the status of a country. Establishment of fully functional systems can be reported as “Yes/No”, or scaled in levels, for example, level 0 if no system is in place; level I if data is only collected and compiled; level II if this data is analysed; level III if outputs are disseminated adequately; or level IV if overall quality control is included.

→ Reported annually using project advancement reports.

#### Livestock production units that have adopted an Animal Welfare management plan – Number/proportion

This indicator measures the number of livestock units, slaughterhouses, dairies and other processing units; animal gathering points; and markets that have received project support and developed and implemented animal welfare management plans. As a minimum, plans should address the Five Freedoms: freedom from hunger and thirst; freedom from discomfort; freedom from pain, injury, or disease; freedom to express normal behavior;

and freedom from fear and distress. This indicator should be broken down by farm size, species and type of farm, where possible.

→ Reported annually using project advancement reports.

#### Livestock production units that have adopted an antimicrobial resistance (AMR) management plan – Number/proportion

This indicator measures the number of livestock production units with AMR management plans that have the objective of decreasing antimicrobial use in animals (measured in kilograms per livestock production unit per year). Management plans should include improving hygiene, and improving wastewater and sludge management in food production, under the One Health approach. National monitoring systems for antimicrobial use can also be used as indicators, in line with antimicrobial surveillance and monitoring capacity.

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#### Farmers/extension agents/service providers— Number

This indicator measures the number of farmers/extension agents/service providers along the supply chains that have been made aware of and trained on animal health issues in the livestock sector, for instance, through the inclusion of animal health issues and options in curriculums, extension manuals, capacity development programs, etc. In addition, the indicator should break down the kind of training received, differentiating between “light training”, such as talks and webinars, “structural modules” (e.g. those of a week in duration), and more robust training based on longer, more in-depth courses.

→ Undertaken using dedicated surveys annually; or at the start of the project, at medium term, and during terminal evaluation.

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## OBJECTIVE 5: STRENGTHEN POLICIES, KNOWLEDGE, AND INFORMATION

### INTERVENTION: **Improve capacities at central and local government levels**

#### ACTIVITIES

- Assess and fill capacity gaps in relevant government ministries.
- Develop early warning and decision support systems and tools.

#### GUIDANCE

##### P7

Where available, use the OIE PVS reports, including those relating to legislation and gap analysis to assess relevant gaps (OIE, 2019).

##### P7

In Particular, address technical assistance, capacity building, and financial resources for monitoring, policy, and extension work, with a special focus on disease prevention, preparedness and control.

##### P7

Provide relevant government ministries (e.g., agriculture, livestock, water, environment, rural development, finance, energy) with capacity building on integrated management (the One Health approach) (Gall et al., 2018).

##### P7

Develop protocols for emergencies, including lines of communication and focal points in each government ministry.

#### INDICATORS

##### **Disease early warning system and emergency preparedness in place— Yes/No**

This indicator measures the creation of an early warning system that builds on the added value of combining and coordinating cross-sectorial alert mechanisms between relevant government ministries, including protocols and a chain of command. It refers to the surveillance system and alert and response strategy to

face emerging diseases, including zoonotic diseases, for which a contingency plan should be implemented, widely known across relevant stakeholder, rehearsed, for example, through simulation exercises. This indicator also measures the improved resilience of pastoralists by enabling destocking, redistribution, or other actions to avoid the loss of livestock value in the event of a crisis.

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- ➔ Reported annually using project advancement reports.

##### **Coordination mechanisms under the One Health approach – Number**

This indicator measures the number of coordination mechanisms implemented by governments that explicitly include the concept of One Health and which aim to be intersectoral across public health, human health and environment. This indicator can also include initiatives from the private sector.

- ➔ Reported annually using project advancement reports.

### INTERVENTION: **Establish research grants and educational programs**

#### ACTIVITIES

- Provide financing options for research and education in livestock development issues.

#### GUIDANCE

##### P7

Promote the creation of think tanks focused on identifying the domestic needs of knowledge and their priorities.

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OBJECTIVE 5:  
**STRENGTHEN POLICIES,  
KNOWLEDGE, AND INFORMATION**

**P7**

Include calls for science and policy research proposals, for example, on livestock waste management, nutrient balancing, zoning, feed resources and feed-use efficiency, animal welfare, labor conditions in production and processing units, and climate-smart livestock development.

**INDICATORS**

**Promotion of R&D in livestock development initiatives— Number of initiatives**

This indicator measures the number of research initiatives (e.g. grants or projects) involving technical personnel or researchers from the country in areas that are relevant to livestock development and sustainability. Such areas include livestock waste management; nutrient balancing; zoning; local and natural feed resources and feed-use efficiency; animal welfare; labor conditions in production and processing units; climate-smart livestock development; local breeds; and local natural resource feed.

➔ Undertaken annually; or at the start of the project, at medium term, and during terminal evaluation.

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