

## A ONE HEALTH APPROACH ON DAIRY PRODUCTION FOR THE NEGROS ISLAND REGION

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## INTRODUCTION

In 2050, the world population will reach 9.7 billion. We are faced with the challenge of how to produce sufficient and safe food, in a way that is sustainable for the environment, and in a way that does not increase antimicrobial resistance in bacteria.

One Health is a holistic, interdisciplinary approach that takes on this challenge. This report takes the One Health perspective and adapts it to the Negros Island Dairy Industry.

## THE CURRENT SITUATION

### Population and Food Requirements

In 2020, world population was at 7.8 billion people. This is projected to reach 9.7 billion in 2050. The population of the Philippines in 2020 was at 109.5 million, projected to reach 144.5 million in 2050. The population of the Negros Island Region in 2020 was at 4.6 million and based on a growth rate of 0.98% (2010-2015) should reach 6.2 million by 2050.

Currently it is estimated that farmers produce 1.5 times the food supply required by the global population.<sup>1</sup> However, for various reasons such as food wastage and difficulties in transporting food to areas of conflict, hunger still affects 9.9% of people globally. Food security is also a national security priority, as many conflicts in the world today are fueled by food insecurity and growing famines arising from ongoing fighting.<sup>2</sup>

Milk and dairy products are an important source of nutrients that can contribute significantly to food security and human health.

<sup>1</sup> Prince. 2017. *Why Is There Still Hunger When We Produce 1.5 Times the Food We Need?* Retrieved from <https://medium.com/illumination/why-is-there-still-hunger-when-we-produce-1-5-times-the-food-we-need-78e7d3c11bb7>

<sup>2</sup> Forman and Umayam. 2016. *Making Food Security a National Security Priority*. Retrieved from <https://www.stimson.org/2016/making-food-security-national-security-priority/>

The Philippines produces less than 1% of its total annual dairy requirement and imports the balance. Local milk production was estimated at 26,000 MT in 2020 and will likely hit 26,500 MT in 2021 due to growing local dairying capabilities and implementation of new dairy development projects. Around 65% of total milk produced is cow's milk, while the rest is carabao milk (31%) and goat milk (4%).

No reliable figures for Negros Island are available on the NDA website. The data for Negros Occidental and Negros Oriental lack units of measurement and the timeline for the data.

### Diseases of Concern in the Dairy Industry

Dairy cattle are susceptible to a wide variety of diseases. Among the more serious ones in the Philippines are foot-and-mouth disease, tuberculosis, brucellosis, and mastitis.<sup>3</sup> Of these, mastitis, or inflammation of the udders or mammary glands, is the most troublesome.

FMD is a highly contagious virus disease, caused by a picornavirus. There is no specific treatment for FMD. The conventional method mainly involves the use of antibiotics, flunixin meglumine, and mild disinfectants.

The other three are caused by bacteria: bovine tuberculosis by *Mycobacterium bovis*, brucellosis by bacteria of the genus *Brucella*, and mastitis by almost any microbe but chiefly various species of streptococci, staphylococci, and gram-negative rods.

There is no treatment for brucellosis in animals. It is controlled by official vaccination and entire herd testing with slaughter of reactors. However, bovine tuberculosis and mastitis, as with FMD, are treated with antibiotics. Studies show that the microorganisms causing these diseases have developed resistance to some of the antibiotics being used to treat them.

### The Threat of Antimicrobial Resistant Bacteria

Antibiotics are vital to the well-being of farm animals, the livelihood of farmers, and the nutrition and health of the human population. Antibiotics are used therapeutically to prevent and treat infectious diseases, and non-therapeutically to promote growth and yield in farm animals.

However, overuse has led to the emergence of antibiotic-resistant bacteria. These bacteria no longer respond to currently available antibiotics – that is, there is no longer any way to prevent or treat infectious diseases caused by these bacteria, resulting in the deaths of animals and people.

Studies show that if antibiotic use is discontinued, bacteria returns to baseline resistance, but infections again begin to increase. The challenge, therefore, is how to reduce the use of antibiotics while still maintaining the health and productivity of farm animals and the safety and quality of dairy and animal products.

In particular, what can local farms in Negros Island do to prevent antimicrobial resistance?

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<sup>3</sup> Dairy Cattle Production Module

**SWOT ANALYSIS OF  
THE NEGROS DAIRY INDUSTRY**



**Strengths**

- Policies are in place in support of the Dairy Sector
- Small farmers are active and willing to cooperate with one another
- Strong support from PVO

**Weaknesses**

- Facing competition from imported milk
- Small Fragmented Farms
- Low quality breed stock
- Small farmers have no access to modern equipment

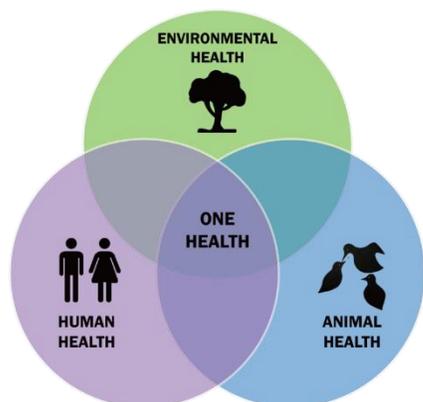
**Opportunities**

- Not yet recognized as a growth sector
- Possibility for specialization
- Age of social media presents opportunity for growth
- Additional income for small farmers

**Threats**

- The fluctuating price of milk
- High initial cost of equipment
- Logistical difficulties due to pandemic

## A ONE HEALTH APPROACH FOR NEGROS



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One Health is an approach that recognizes that the health of people is closely connected to the health of animals and our shared environment.<sup>5</sup> It is the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals, and our environment.<sup>6</sup>

### The Example of Sweden

Sweden has been very successful in reducing antibiotic use while increasing dairy productivity. Their focus has been on improving animal health, rather than reducing the use of antibiotics. **“Healthy animals do not need antibiotics”** is their slogan. Additionally, the Swedish dairy industry has a long history and strong culture of cooperation that continues to this day between farmer organizations, veterinary professionals, and government agencies, facilitating the development and implementation of best practices. Finally, this holistic approach further benefits from substantial financial and legislative support from the Swedish government.

It may be challenging for the developing nation of the Philippines, let alone the local regions of Negros Occidental and Oriental, to implement these practices to the same extent. It may be challenging for the national government

to provide the same level of legislative, financial, and practical support.

However, spreading awareness and information at the level of local private dairy farmers will encourage them to become advocates of the One Health approach, the prudent use of antibiotics, and the fight against AMR bacteria.

### Prudent Use of Antibiotics

In case of the absence of legislation banning the sub-therapeutic use of antibiotics, or requiring a veterinary prescription to obtain and use antibiotics, local farmers can take it upon themselves to stop using antibiotic feed additives (AGPs), work with veterinarians towards a more prudent use of antibiotics, and turn to alternatives such as organic teat dips and other preventive measures.

### Preventive Measures

#### Focused on Animal Welfare

An ounce of prevention is worth a pound of cure. Animals in full health and strong immune systems are better able to fight off disease. Moreover, milk secretion is a process which can be carried out by the female with maximum efficiency only if she is healthy. A good herd health program is centered on the prevention of diseases and other health problems, rather than on the sporadic treatment of various conditions.

All this can be achieved through adequate nutrition and sanitation, clean and comfortable housing, responsible breeding, and effective dairy farm management techniques such as proper milking hygiene.

#### 1. Nutrition

In the early 1980s, modern agriculture was criticized for using antibiotics to counteract the negative effects of poor rearing conditions. Providing adequate safe water, adequate nutritious feed, and safe and sanitary housing results in overall healthier and happier animals

<sup>4</sup> By Thddbfg - Own work, CC BY-SA 4.0, <https://commons.wikimedia.org/w/index.php?curid=81872126>

<sup>5</sup> [www.cdc.gov](http://www.cdc.gov)

<sup>6</sup> One Health Initiative Task Force (OHITF)

with stronger immune systems and increased productivity.

Ensure that the nutritional needs of the animal is in proportion to its work. Plan ahead to source food and water in the required amounts to lessen the workload of the dairy workers.

An adequate source of water must always be available. Most dairy farms have irrigation systems for their plants that are used as feeds; and for the animal, always ensure that the water source is clean and free of harmful pathogens.

The required amount of feed and water must be given regularly, although there are also approved and quality commercial feeds if the requirements are not met by the available feeds in the farm. Make sure to have fresh stocks. Provide a cool and dry area when stocking the feeds. Inspect for molds growing on the feeds, discard immediately, and do not recycle.

## 2. Sanitation and Health

Prevent diseases from entering the farm. Biosecurity must not be taken for granted. Prohibition on entry in the farms or use of disinfectants and wearing of PPE's for visitors must be practiced to avoid spread of pathogens.

Regularly check for signs for sick animals. Make sure to be able to isolate to prevent the contamination of the whole herd. Have a ready to call veterinarian(s) that can be contacted so that animals who need to be attended can be treated right away.

Vaccinate all animals that are required or recommended by the authorities and veterinarians to create herd immunity and to stop spreading contagious diseases in the region. Vaccinations are also a way to prevent infections or diseases that may otherwise demand antibiotic treatment.

## 3. Housing

Farm buildings intended for animal use must provide good ventilation and keep the animal protected from external hazards that could hinder their performance. The area must be well

maintained and sanitized regularly to prevent breeding of harmful pathogens that will affect animal health.

### Minimum Floor Space Requirement for Dairy Cattle<sup>7</sup>

Class, Age, Size of Animal	Shed or Barn Floor Area m <sup>2</sup> /animal
Calves (up to 3 months)	1
Calves (3 - 6 months)	2
Calves (7 months – one year)	3
Yearlings (1 – 2 years)	4
Heifer/Steer (2 – 3 years)	5
Milking and dry cows	6
Cows in maternity stall	10

Flooring must be non-slippery or skid resistant with good drainage system for waste management. Provide appropriate roofing for the milking area and shade for the grazing area. The milking parlor must have adequate space that is not too confining but enough to restrain the animal, and where it is easy and convenient to milk.

## 4. Breeding

More resilient and productive herds may also be achieved through breeding. Sweden has been successful in breeding cattle with resistance to mastitis and with improved foot and leg health. (One guideline is to cull cows with chronic mastitis.)

Choosing the right breed is one of the many factors to consider for improving herd health in a dairy farm. DV Dairy Farm located in Balibago, Batangas, uses Holstein Jersey and Holstein-Friesian breeds as both are tolerant to our tropical climate and both have traits for producing more milk. Considering traits of past stock with disease-resistant qualities must be utilized as it will give positive outcomes for the next generations.

<sup>7</sup> <https://amtec.ceat.uplb.edu.ph/wp-content/uploads/2019/07/407-1.pdf> - Table 1

## 5. Milking Hygiene

Technicians and farm workers must be trained to be qualified for the safety standards required as food safety is always a concern, and is highly observed especially in workers in charge of these areas. Milking operations must be done in a consistent manner; Pinky's dairy farm in Lipa, Batangas has adapted a routine where music is played in the farm when it is milking time. Using classical conditioning on the cows promotes a stress-free operation.

Prepare before milking, such as using udder dips before operation for sanitation. When using a milking machine, always sanitize before and after use on every cow that is being used to avoid contamination. If no milking machine is use, you must also have a sanitized equipment that will be use for the operation.



Keep an eye on selected animals that are sick, under treatment or that have an abnormal milk appearance. Segregate their milk to either store for examinations or to discard.

Keep all equipment well maintained at all times. Milking areas must be sanitized regularly or after every after milk collection.

### Note on Animal Welfare

The essence of this is that farm owners, managers, and staff must be sensible and sensitive to the needs of their livestock. We must be concerned about the wellbeing of the animal.

According to the FAO on Guide to Good Dairy Farming Practice in the Animal Welfare section, animals are entitled to these five freedoms:

- Freedom from hunger and thirst
- Freedom from discomfort
- Freedom from pain, injury and disease
- Freedom from fear
- Freedom to engage in relatively normal patterns of animal behavior

### Dairy Dynamic Management

Dairy Dynamic Management (DDM) utilizes a team of specialists. This team establishes critical control points and develops a protocol-based management system tailored to the farmers' specific needs.

The system establishes clear goals and objectives, SOPs and good record keeping.<sup>8</sup>

The DDM team is composed of a Scientific Consultant who provides training and scientific input; a DDM Specialist who trains, facilitates, and monitors; the Dairy Manager or Owner who provides direction and support, and also assists with training; and the Dairy Worker who provides input, monitors, and implements changes.

### Organization and Cooperation

Organizations are a good source of solutions for specific problems, best practices, and updated information. Join organizations of dairy farmers at regional, national, and international levels – preferably all three.

### The Role of National Government

There are several divisions of the National Government that play a major role in the local Dairy Industry.

**The National Dairy Authority** enhances the dairy business through delivery of technical services. They also aim to accelerate dairy herd build-up and milk production, increase coverage of school milk feeding programs, and promote milk consumption.

The NDA functions as a regulatory agency authorized to perform the following: control measures; register dairy farms; train farmers and food safety inspectors; inspect and audit dairy processing plants and farms; check compliance; issue certificates and penalize.

**The Bureau of Animal Industry** is in charge of preventing diseased animals from being used as food, and for promoting livestock disease research. It enforces animal import regulations, and regulates the interstate movement of animals.

Its mission is to make the animal industry productive and profitable under sustainable conditions through sound policies, programs,

research and services on animal production, post-harvest, health and welfare.

**The Provincial Veterinary Office**, headed by Provincial Veterinarian Renante Decena, also plays a major role on promoting food security and local economic growth by improving its dairy industry.

One example of the many projects they did aims to encourage local government units to get involved in undertaking a whole-year round milk feeding program in their respective communities. By doing so, farmers are able to improve the production of their dairy farms.

**The Inter-Agency Committee on Antimicrobial Resistance (ICAMR)** involves the Department of Agriculture (DA), the Department of Health (DOH), the Food and Agriculture Organization of the United Nations (FAO), and the World Health Organization (WHO). It has published the Philippine National Action Plan on Antimicrobial Resistance 2019-2023.

## SUMMARY OF PRACTICES TO IMPLEMENT

We have determined in the previous section that a One Health approach to dairy production for Negros involves prudent use of antibiotics, preventive health measures with a focus on animal welfare, a protocol-based management system developed by a team of specialists, cooperation among farmers and also between farmers and other partners in the dairy industry, and last but not least, support from the government.

We summarized these recommendations in the form of a checklist, to serve as a helpful guide for dairy farmers and other industry professionals. This checklist is found at the end of the report.

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<sup>8</sup> Garcia et al. 2019. One Health Perspective on Dairy Production and Dairy Food Safety

## CONCLUSION

We have discussed the challenge of achieving food security and the threat of antimicrobial-resistant bacteria that face us in the near future.

We have discussed how a One Health approach to dairy production may be applied to the Negros Island Region, so that our region may be better equipped to deal with these challenges.

We have only outlined the basics of such a plan, but hope that this report will be of some help and use to the reader.

## REFERENCES

- Garcia et al. 2019. One Health Perspective on Dairy Production and Dairy Food Safety.
- FAO. 2020. Tackling antimicrobial use and resistance in dairy cattle: Lessons learned in Sweden.
- Prince. 2017. *Why Is There Still Hunger When We Produce 1.5 Times the Food We Need?* Retrieved from <https://medium.com/illumination/why-is-there-still-hunger-when-we-produce-1-5-times-the-food-we-need-78e7d3c11bb7>
- Forman and Umayam. 2016. *Making Food Security a National Security Priority*. Retrieved from <https://www.stimson.org/2016/making-food-security-national-security-priority/>
- Dairy Cattle Production Module
- vikaspedia.in. 2017. Housing for Dairy Cattle
- Smartsense. 2018. From Farm to Fork: The Dairy Supply Chain

**A ONE HEALTH APPROACH ON DAIRY PRODUCTION  
FOR THE NEGROS ISLAND REGION  
CHECKLIST FOR LOCAL DAIRY PRODUCERS<sup>9</sup>**

*Disclaimer: This checklist is in no way comprehensive or in-depth. Corrections and additions from industry professionals are necessary and welcome.*

<b>PRUDENT USE OF ANTIBIOTICS</b>		
	<b>YES</b>	<b>NO</b>
<b>Education &amp; Awareness</b>		
Educate dairy workers on the the role of antibiotics in human health and animal health, the danger of antimicrobial-resistant bacteria, and the need for prudent use of antibiotics.		
Train dairy workers in preventive measures and the proper care and management of dairy cattle.		
<b>Non-therapeutic or Sub-therapeutic Use</b>		
Do not use antibiotics for any non-therapeutic or sub-therapeutic purposes, such as in feed as growth promoters.		
<b>Therapeutic Use</b>		
Do not obtain antibiotics before submitting the animal to a veterinary examination and obtaining a veterinary prescription.		
Obtain antibiotics from a registered veterinarian or pharmacy.		
Use antibiotics as specified on the label.		
Observe correct meat and milk withdrawal periods according to the manufacturer's specifications on the label.		
<b>Alternatives to Antibiotics</b>		
Implement preventive measures.		
Consider organic alternatives such as teat dips.		
Consult a veterinarian regarding alternative treatments.		

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<sup>9</sup> References:

Dairy Cattle Production Module

vikaspedia.in. 2017. Housing for Dairy Cattle

Smartsense. 2018. From Farm to Fork: The Dairy Supply Chain

<b>PREVENTIVE MEASURES</b>		
<b>Improve Animal Welfare &amp; Increase Production with Minimal Use of Antibiotics</b>		
<b>“Healthy animals don’t need antibiotics.”</b>		
	<b>YES</b>	<b>NO</b>
<b><i>Feeding Management</i></b>		
Obtain a feeding program from an industry or veterinary professional.		
Feed animals according to age, size, and other nutritional needs.		
Obtain feeds from a reputable source or supplier.		
Make sure that the feeds do not contain antibiotic residues.		
Use a magnet to remove scrap metal from feeds.		
Store feeds properly.		
Provide water that is fresh, safe, clean, and plentiful.		
<b><i>Sanitation &amp; Health</i></b>		
Prevent exposure to disease-producing organisms.		
Maintain sanitation and cleanliness.		
Isolate incoming animals for at least 14 days.		
Maintain high level of resistance.		
Obtain a vaccination program from a veterinary professional.		
Vaccinate for diseases for which there is an effective vaccine.		
Maintain all animals at a good level of nutrition.		
Provide vitamin supplements.		
Provide a comfortable environment.		
Reduce the spread of diseases that do occur.		
Isolate animals that contract or are suspected of contracting a contagious disease. Quarters inhabited by such animals must be thoroughly cleaned and disinfected before use.		
Rapid, accurate diagnosis and prompt treatment of diseases. This may involve blood testing and other laboratory diagnostic tests as well as post mortem examination.		
Dairy workers must regularly monitor the herd for minor abnormalities before they become serious problems.		
Properly dispose of waste.		
Maintain and use an accurate health record system. Good records can aid in the diagnosis of problems, alert dairy workers to potential problems, and ensure that important details are not overlooked such as missing vaccinations on some animals.		
Maintain a good working relationship between the owner, dairy manager, dairy workers, veterinarian, and government animal health extension personnel.		
Avail of NDA animal health services. These include vaccination, testing, and vitamin supplementation.		

<b>Housing Management</b>		
Obtain housing specifications from an industry professional.		
Sheds must have proper facilities for milking barns, calf pens, calving pens, and arrangement for storage rooms, etc.		
Each shed must have a feeding manger, drinking area, and loafing area. There must be adequate space for the free and comfortable movement of animals.		
Sheds must be easy to clean.		
Temperature and ventilation must be well-regulated.		
Regularly clean and sanitize housing. Sunlight is a potent sanitizer and does not increase antimicrobial resistance. Other effective disinfecting agents are bleaching powder, iodine and iodophor, sodium carbonate, slaked lime and quick lime, and phenol. Use according to manufacturer specifications.		
Floorings must be dry and clean to prevent hoof and udder injuries.		
Remove all scrap metal from the area to prevent injuries and reticulitis.		
Insecticides may be used periodically to kill ticks and other insects. Insecticides are highly poisonous and must be handled with care. Keep away from food, feeds, drinking water, and milk.		
Secure housing from rodents.		
<b>Breeding for Healthier and More Productive Cattle</b>		
Maintain and use accurate records for health and for production.		
Select for breeding animals that pass industry benchmarks for health and production.		
Do not select for breeding, or select for culling, animals that do not pass industry benchmarks, particularly those with chronic diseases.		
Only breed animals of equal health status.		
Upgrade local cattle by artificially inseminating with the semen of 100% purebred Holstein-Friesian or other suitable breed.		
Avail of the NDA Bull Loan program by which purebred and crossbred dairy bulls are available at Regional Field Units of the Department of Agriculture or other Dairy Bull project partners for semen production, collection, and processing purposes.		
<b>Waste Management</b>		
Regular cleaning of the farm and premises.		
Segregation of wastes to their proper designations.		
Proper and functional drainage canals.		
Used bottles, syringes, and vials shall be disposed of based on the manufacturer's recommendation or instruction.		

<b>Care &amp; Management of Calves</b>		
See to it that they drink the colostrum for the first 3 days after calving as this will increase their body resistance.		
The umbilicus should be painted with tincture of iodine in order to prevent infection.		
The first 14 days of the calf's life is most crucial. Protect them against cold wind and infection. The best disinfectant for barns and platforms is slaked lime powder applied twice a week.		
Perform routine deworming after 3 months.		
In case of ticks, Asuntol is the best treatment. Rub on the body once every 2 weeks.		
Calves may be allowed to go with the dams during the day and separated at night.		
Provide calf pens from the weaning stage to five months of age. This type of shed is open at the front and back and has a partition between calves. A feed and water pail can be at front. It has excellent ventilation and is easier to clean.		
<b>Care &amp; Management of Gestating Cows</b>		
Isolate from other animals. Animals in advanced pregnancy must be separated into calving boxes which must be cleaned and properly disinfected, bedded with clean, soft, & absorbent litter.		
In advanced pregnancy, high yielding and first gestation animals are susceptible to milk fever. To avoid it, provide enough minerals especially calcium by bone meal in daily diet. Give large doses of Vitamin D about a week prior to calving.		
Avoid milking prior to parturition, as this is likely to delay parturition by a few hours.		
Watch for parturition signs. (Udder becomes large and distended. Either side of the tail head has a depressed or hollow appearance. Vulva is enlarged with thick mucus discharge. Uneasiness.)		
<b>Milk Production Management</b>		
Technicians and farm workers must be trained to be qualified.		
Milking operations must be done in a routinely timely manner (2x daily at 5 AM and 5 PM).		
Always wear appropriate clothing.		
When using a milking machine, always sanitize before and after every use on every cow that is being used to avoid contamination. If no milking machine is used, you must also sanitize all the equipment that will be used for the operation.		
Observe closely animals that are sick, under treatment, or has an abnormal milk appearance. Segregate their milk to either store for examinations or to discard them.		
Keep all equipment well maintained at all times.		
Milking areas must be sanitized regularly after every milk collection.		

<b>DAIRY DYNAMIC MANAGEMENT</b>		
	<b>YES</b>	<b>NO</b>
Scientific Consultant, DDM Specialist, Dairy Manager or Owner, and Dairy Workers must all be properly trained and qualified.		
Establish goals and objectives, protocols and procedures, and good record-keeping tailored to the specific needs of the Farmers or Producers.		

<b>DAIRY FARMER ORGANIZATIONS</b>		
	<b>YES</b>	<b>NO</b>
Join a local organization.		
Join an international organization.		
Keep up-to-date with best practices.		
Avail of programs and initiatives.		

**A ONE HEALTH APPROACH ON DAIRY PRODUCTION  
FOR THE NEGROS ISLAND REGION  
CHECKLIST FOR LOCAL DAIRY INDUSTRY PARTNERS**

<b>COOPERATION</b>		
Representatives among the dairy farmers, veterinary professionals, medical professionals, and scientists from relevant fields should regularly communicate and collaborate. Ideally, ICAMR should organize and facilitate this communication and collaboration.		
<b><i>Veterinary Professionals and Medical Professionals</i></b>		
Attend a refresher course on prudent use of antibiotics. Stay updated.		
Do not use broad-spectrum antibiotics if narrow-spectrum will suffice.		
Consider alternatives such as organic treatments.		
<b><i>Scientists</i></b>		
Attend a refresher course on prudent use of antibiotics. Stay updated.		
<b><i>Government</i></b>		
<b>Financial Support.</b> Dedicate budgets to training, health programs and initiatives, breeding programs, and proper incentivization of		
<b>Legislative Support.</b> Develop laws, policies, and regulations in support of a One Health approach to dairy production focused on animal welfare and on tackling antibiotic use and resistance.		
<b>Programs and Initiatives.</b> Develop and implement dairy industry programs and initiatives in support of a One Health approach to dairy production.		
Communicate and cooperate with the various One Health organizations such as the One Health Commission, One Health Initiative, One Health Platform, and with One Health partner organizations such as WHO, World Organization for Animal Health, FAO, and CDC.		

**A ONE HEALTH APPROACH ON DAIRY PRODUCTION  
FOR THE NEGROS ISLAND REGION  
CHECKLIST FOR LOCAL DAIRY INDUSTRY PARTNERS:  
THE MILK SUPPLY CHAIN**

<b>MILK SUPPLY CHAIN: CRITICAL CONTROL POINTS</b>		
<i>Milk and dairy products have been associated with foodborne illness for centuries, and as a result, are the most highly regulated foods. The milk industry was the first sector of the food industry to implement its own regulations to improve food safety.</i>		
	<b>YES</b>	<b>NO</b>
<b>Production</b>		
Farm must adhere to industry standards and government regulations.		
Store milk below 40°F or 4°C and for no more than 48 hours.		
Milk must pass FDA inspection for safety and quality.		
<b>Distribution</b>		
<i>The transport of milk and dairy products occurs generally at three stages: from farm to processing/manufacturing plant, from plant to distribution center, and from distribution center to retail outlets.</i>		
All dairy products must be stored and transported at proper temperatures.		
Storage and transport must be rapid with minimal disruptions.		
<b>Processing</b>		
<i>Fluid milk is here made into different dairy products and packaged for distribution. It is at this stage that safety regulations have been most significant.</i>		
All milk products must be pasteurized. They may also be homogenized and fortified.		
Fluid milk can be transformed into a variety of products. Each product and process must adhere to industry standards and government regulations.		
Packaging must adhere to industry standards and government regulations.		
<b>Retail</b>		
All dairy products must be stored at proper temperatures at every point of purchase, including refrigerator and freezer cases, deli departments, cafeterias, salad bars, and vending machines.		
Temperatures must be monitored continuously.		