Food and Agriculture Organization of the United Nations

FMM/RAS/298: Strengthening capacities, policies and national action plans on prudent and responsible use of antimicrobials in fisheries Final Workshop in cooperation with AVA Singapore and INFOFISH

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Best Management Practices in Tilapia and Carp Aquaculture

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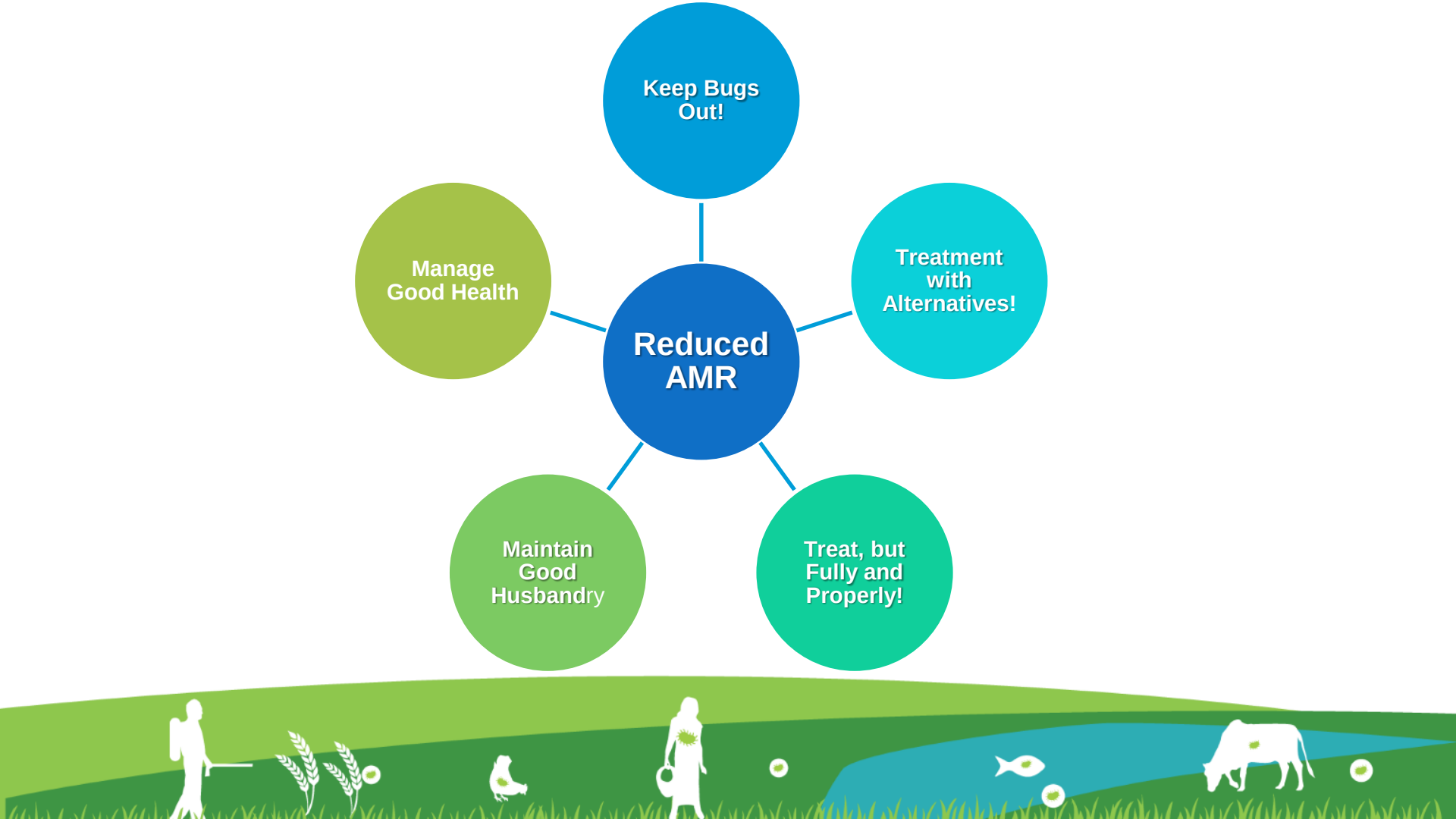
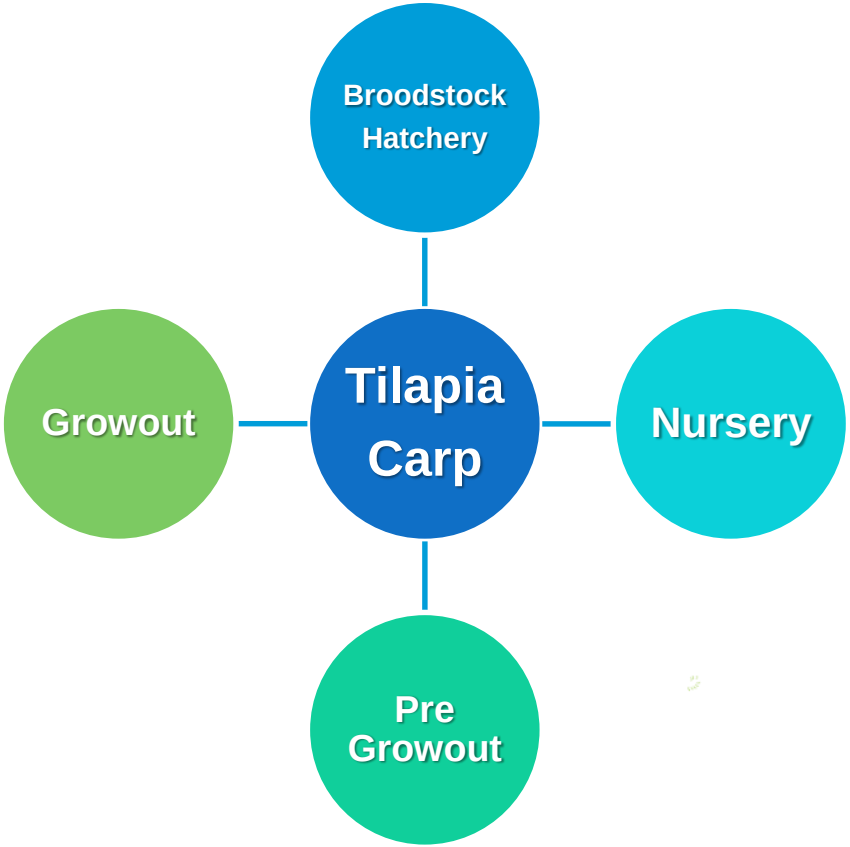
WHAT IS “BEST MANAGEMENT PRACTICE”?

WHAT IS “BEST MANAGEMENT PRACTICE” FOR REDUCING AMR?

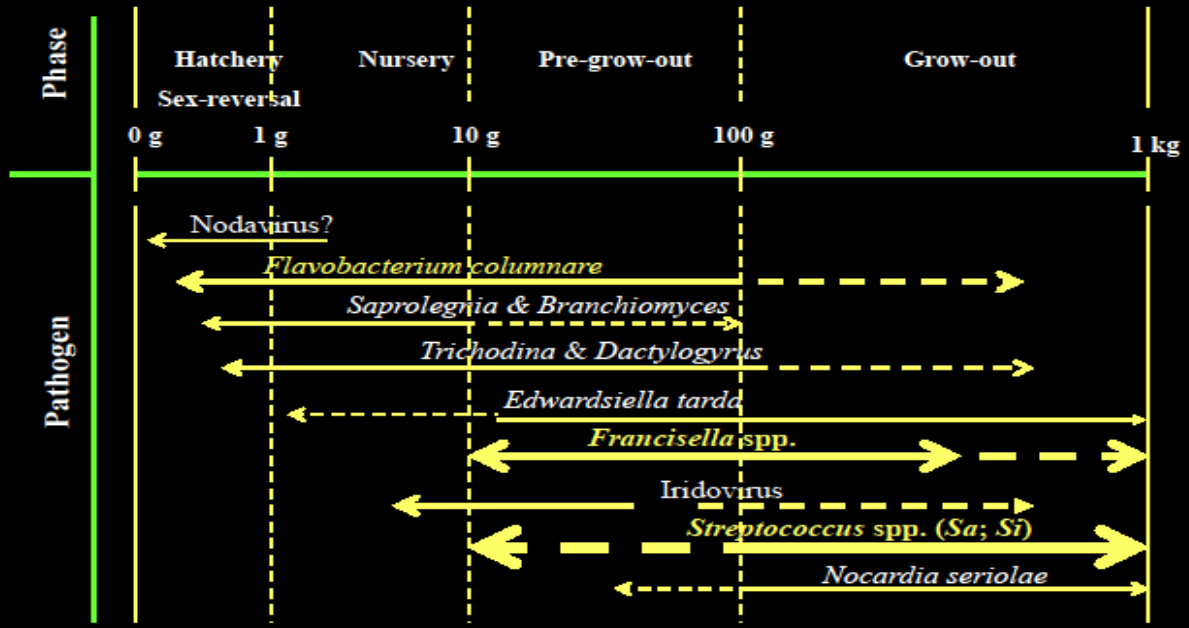
TRY NOT TO USE “ANTIMICROBIALS”?

TRY NOT TO USE “ANTIBACTERIALS”?


Keep Bugs Out!
Manage Good Health
Treatment with Alternatives!
Reduced AMR
Maintain Good Husbandry
Treat, but Fully and Properly!


Broodstock
Hatchery
Growout
Tilapia
Carp
Nursery
Pre
Growout

Tilapia production Diseases



Note: importance of the disease is roughly in proportion to the size of the arrow bars

The Fish Site

Carp Diseases

Pathogen	Type
Saprolegniosis	Fungus
*Branchyomycosis (G*ill rot)	Fungus
Carp erythrodermatitis (E.g.. *Aeromonas*)	Bacteria
Columnaris disease / BGD (Eg. *Cryptophaga*)	Bacteria
Mycobacteriosis	Bacteria
Spring viraemia of carp	Virus
Carp pox	Virus
Koi Herpes Virus Disease (KHV)	Virus
Ectoparasites (*Trichodina*)	Protozoa

Pathogen	Type
Monogenians (Eg. *Gyrodactylus*)	Parasite
Trematodes (Eg. *Sanguinicola*)	Parasite
Cestodes (Eg. *Ligula*)	Parasite
Nematodes	Parasite
Analids (Leeches)	Parasite
Arthropods (Eg. *Lernaea*, *Argulus*, etc.)	Parasite

Challenges

- Aquatic environment
- Complexity of aquaculture
- People and communities involved in production
- Lack of appropriate, affordable and practical tools
- Limited availability of drugs and antibacterials
- Recognition and priority

General husbandry management

- Use good husbandry practices to maintain a favourable growing environment:
  - Avoid overcrowding
  - Provide optimal nutrition
  - Manage feed (promptly remove uneaten or undigested food, etc.)
  - Promptly remove dead/moribund animals
  - Maintain good water quality
  - Minimize stress (inappropriate and unnecessary handling, temperature extremes, etc.)

General husbandry management

- Use good health management practice to reduce disease risks:
  - Establish and follow a disease surveillance and diagnostic program.
  - Maintain effective biosecurity.
  - Establish “Three Tire Biosecurity and Health Management”
    - Train personnel on the normal behavioural patterns of fish, to easily distinguish abnormal behaviour patterns as a means for early recognition of stress or disease.

General husbandry management

- Use good health management practice to reduce disease risks:
  - Proper diagnosis of disease and appropriate action/treatment.
  - Use antimicrobials and other remedial agents consistent with the label instructions or as directed by a licensed veterinarian.
  - When necessary, provide adequate quarantine and/or isolation practices and procedures.

General husbandry management

- Use good health management practice to reduce disease risks:
  - Observe fish behaviour and feeding activity to detect disease problems (Level I diagnosis).
  - Periodically test water quality and cross check against physiological limits of the species. Carryout control action and keep records.
  - Ensure high quality diet.
  - Store feeds and drugs under cool, dry conditions to prevent degradation.
  - Clean/sanitize nets and handling equipment to prevent the spread of disease.

General husbandry management

- Use good health management practice to reduce disease risks:
  - Clean tanks and remove debris
  - Clean and sanitize ponds and tanks before stocking
  - Sanitize tanks or ponds following disease outbreaks
  - Ensure no spillage and leakages in the production system

General husbandry management

- Use good health management practice to reduce disease risks – Drug and chemical usage and handling:
  - Use and follow all product label directions, during use, storage and disposal.
  - Use chemicals and antimicrobials in accordance with national laws.
  - Maintain a log of chemical usage at the facility and allow for inspection

General husbandry management

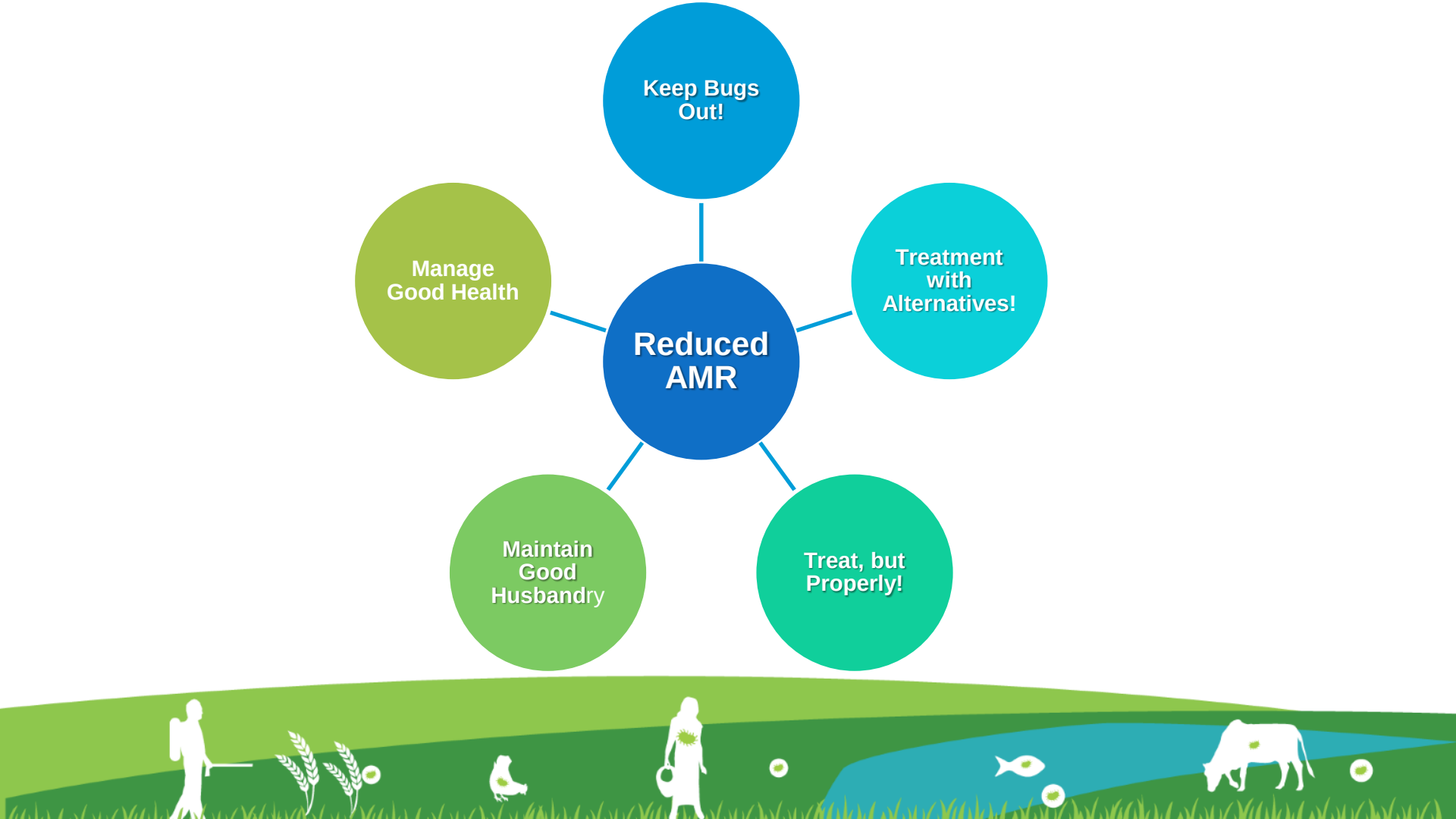
- Use good health management practice to reduce disease risks – Drug and chemical usage and handling:
  - All drugs, therapeutic substances, and antibiotics must be used, applied, stored, or disposed only as directed by an approved product label or as prescribed by a licensed veterinarian.
  - Drugs may not be used or prescribed for extra-label use when the drug label prohibits extra-label use.
  - Maintain a log of drug usage at the facility.

National Policy and Strategy

- National Aquatic Animal Health Strategy
- Regulations on trans-boundary movement of live aquatics
- Regulations on veterinary drugs
- Regulations on farm and facility certification and licencing
- Regulations on food safety

Research Opportunities

- Genetically improved varieties
- New antibacterials
- Vaccines
- Low cost, yet effective remedies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Thank You!