GF-TADs
GLOBAL FRAMEWORK FOR THE PROGRESSIVE CONTROL OF TRANSBOUNDARY ANIMAL DISEASES

Food and Agriculture Organization of the United Nations

WORLD ORGANISATION FOR ANIMAL HEALTH

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Preventive measure and biosecurity for small pig farm

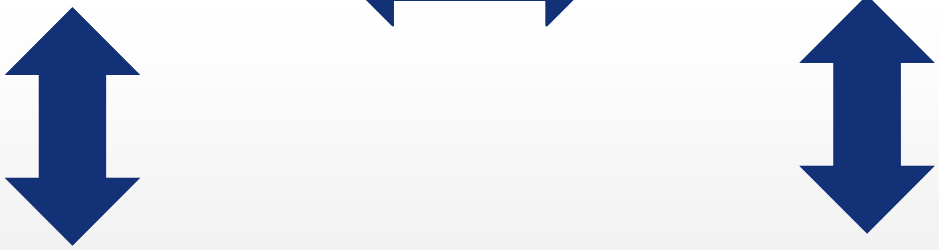
Biosecurity at backyard and small-scale farms

Biosecurity

1. General information,
2. Farm level,
3. Within the framework of disease control,
4. Specific risk factors for ASFV transmission,
5. Biosecurity guidelines.

The epidemiology

The source of infection ⟷ **Susceptible animal**



A set of environmental factors enabling the combination of the above mentioned components.

Important factor - the density of animals.

Transmission of the disease

Horizontal transmission		
Direct	Indirect	Air
Direct contact droplet path, mating, birth	secretions, excretions Vectors Enviroment	droplet path, dust
Vertical transmission		
	Infection- foetus, milk, colostrum	

Biosecurity

A set of management and physical measures designed to reduce the *risk* of introduction, establishment and spread of animal diseases, *infections* or *infestations* to, from and within an animal population.

Glossary TAHC OIE 2018

The implementation of measures that reduce the risk (1) of the introduction and (2) spread of disease agents; it requires the adoption of a set of attitudes and behaviours by people to reduce risk in all activities involving domestic, captive/exotic and wild animals and their products”

(FAO/OIE/World Bank, 2008 – Good Practices for Biosecurity in the Pig Sector)

Why is biosecurity important?

•Pig health is determined by management

•Pig management systems:

–Large intensive production systems

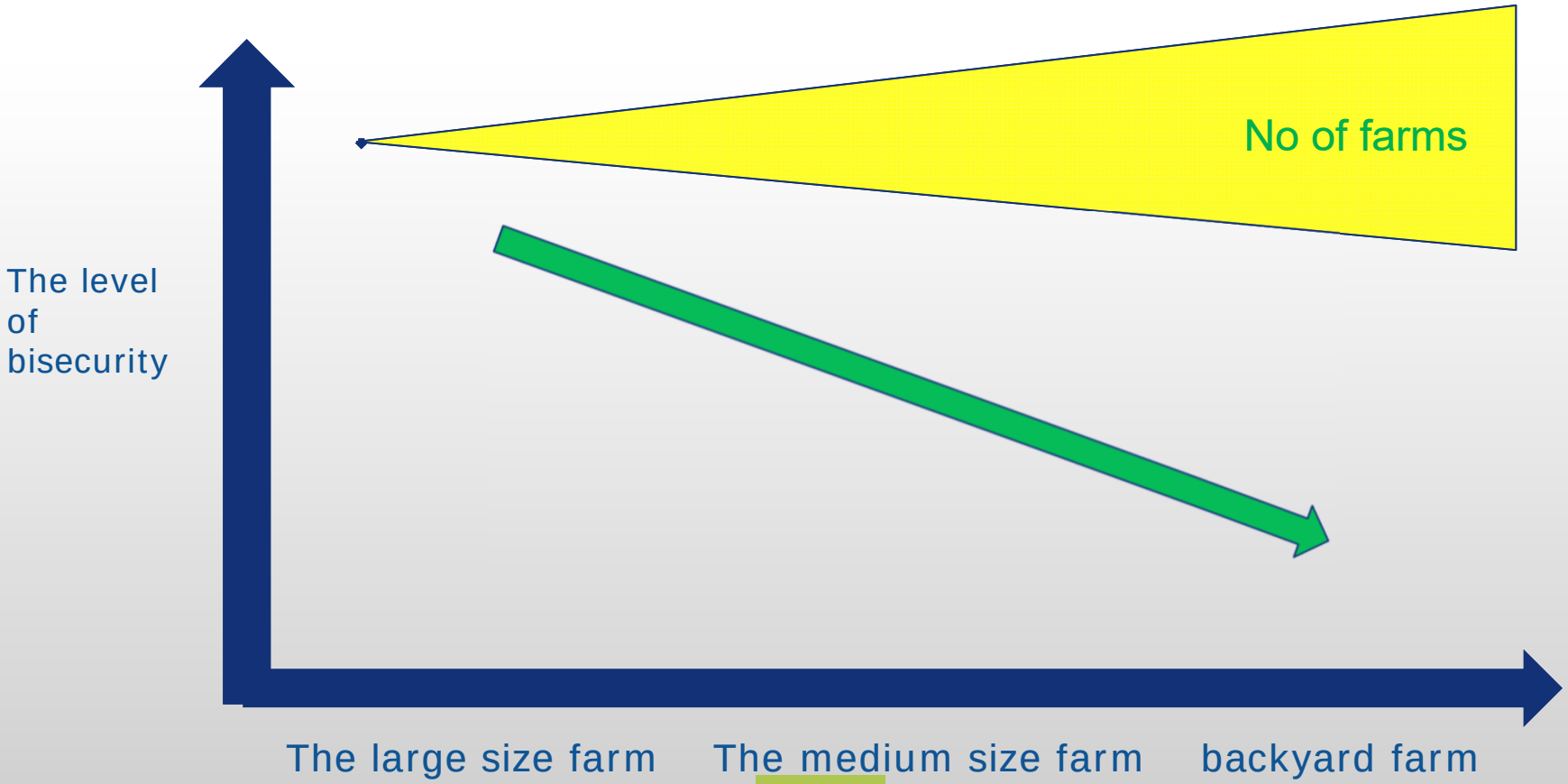
–Small holder systems (backyard farming, free range…)

- Scavenging pig production

•All of these systems carry risks of diseases occurrance;

•Biosecurity is important because it prevents diseases and prevention is better than cure, or control only, which is not always successful.

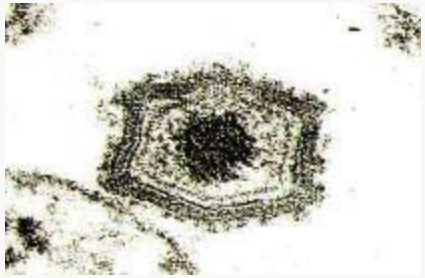
Standard correlation of biosecurity level with the size of establishment



Potential sources of pathogens for pigs

- Other domestic pigs
- Wild boars
- Other animal species, especially:
  - Rodents (salmonellosis, leptospirosis and others)
  - Birds (salmonellosis; influenza viruses)
  - Arthropod parasites, vectors and contaminators
- Humans (influenza, tuberculosis; act as fomites)
- Fomites (vehicles, equipment, anything that can be contaminated with infectious material)
- The environment – soil, water, air

African Swine Fever:



The ASFV: large enveloped DNA virus genus Asfivirus, family Asfaviridae, one serotype but 16 genotypes and different strains of different virulence. The virus is very stable, and survive in excretion, carcasses, pig meat, pig meat products…

Spreading Potential:

- Very long viremic period
- ASFV is resistant in the environment
- A range of wild and domestic pigs species are susceptible
- ASFV can remain infectious for 3–6 months in uncooked pork products
  - **Chilled meat: at least 15 weeks**
  - **Frozen meat: up to 1000 days**
  - **3 to 6 months in hams and sausages**
- Soft ticks of the genus *Ornithodoros* may act as biological vector, within the vector: trans-stadial, trans-ovarial, and sexual transmission occur

ASF: sources of infection

- Infected pigs.
- Meat from infected pigs, including processed products not exposed to high temperatures (80 C degree) for sufficient time,
- Any material contaminated by secretions and excretions of infected pigs (straw, green feed)
- Mechanical transmission by bites of stable flies (*Stomoxys calcitrans*) and injections with contaminated needles
- Bites from soft ticks (*Ornithodoros* species) not in Eastern Europe.

Scientific Opinion on African swine fever

(EFSA Journal 2014;12(4):3628)

Table 1: Main sources and routes of transmission established during the outbreaks of ASF in domestic pigs in years 2008-2012

Source and transmission of virus	Number	%
Selling infected pigs	1	0,3
Neighbourhood (infected pigs in backyards)	5	1,7
Direct contact with humans (having a meal right at the farm)	1	0,3
Contact during transportation, shipping, movement	108	38
ASFV infected wild boar	4	1,4
Swill feeding	100	35
Not established	65	23
Total:	284	100

Source: Belyanin, 2013

The elements necessary for the implementation of biosecurity

The Farm

- Size (?)
- Type of production
- Management
- Infrastructure/limits
- Health Status

The Surrounding

- Location
- Animal density
- Health Status

The Epi Situation

Peace time

Emergency

Farm - complex, multidimensional structure

1. Different age groups of animals,
2. Different geographical origins,
3. Different health status, in a relatively small space.
4. Movement of feed, waste, means of transport, persons, etc.

Main Elements of Biosecurity

Segregation:

- ✓ Controlling the entrance of pigs: from outside farms, markets or villages;
- ✓ implementing quarantine for newly purchased animals;
- ✓ limiting the number of sources of replacement stocks;
- ✓ fencing the farm area and controlling access for people, as well as wildlife, birds, bats, rodents, cats and dogs;
- ✓ maintaining adequate distances between farms;
- ✓ providing footwear and clothing to be worn only on the farm;
- ✓ using an all-in-all-out management system.

- *Cleaning and Disinfection*
  - ✓ buildings on the premises, but also vehicles, equipment, clothing and footwear
  - ✓ **Disinfectants**

(FAO/OIE/World Bank, 2008 – Good Practices for Biosecurity in the Pig Sector)

Biosecurity

in practice is implemented through:

Physical protection measures:

- Enclosing, fencing, roofing, netting
- Cleaning, disinfection and control of insects and rodents

- *Management measures:*
  - Procedures for entering and exiting the establishment for animals, products, vehicles and persons
  - Procedures for using equipment
  - Conditions for movement based on risk involved
  - Conditions for introducing animals or products into the establishment
  - Quarantine, isolation or separation of newly introduced or sick animals
  - A system for safe disposal of dead animals and other animal by-products.

Prevention

- Prevent contact with potentially infected pigs (domestic, feral, wild boar)

– Pigs should be permanently confined in pig-proof premises (pig sties, a fenced or walled camp)

– Pigs (new pigs, boars for service) should be introduced only from sources known to be healthy and free of infection

– Quarantine of newly arrived animals - 30 days or all-in-all out rule

- Fencing and segregation of animals - age groups, production groups

- Separation of the feeding area from the places of residence, nurseries

- **Not participating in shows, fairs**

Prevention -infected pig meat

Prevent pigs from eating meat or carcasses of other pigs:

–Pigs should not scavenge on garbage dumps or in areas with potential remains of dead pigs, boars

–Pigs should not be fed with kitchen waste or other leftover food (swill) that could contain uncooked or undercooked pork (including salted, fermented, dried, and smoked pork)

–If there is any doubt, must be boiled for 30 minutes with constant stirring to destroy the virus and cool before feeding

Prevention - people

Contact with potentially contaminated people and fomites has to be prevented

–Limit access to pigs as far as possible

–Do not visit premises where pigs are sick

–Thorough decontamination and disinfection of footwear, hands and equipment (use detergent, brush, disinfectant – 2% caustic soda, sodium hypochlorite or commercial disinfectant registered for use against ASF virus), or provide footwear

- Working clothes should be dedicated for each pig house.

–Do not share tools or equipment with other pig producers

–Do not buy or accept leftover feed, feed bags or bedding from other pig producers

People movement - sectors

Key for delivery places, nurseries, feed warehouses, e.g. through the colour of boots.

Information boards on the fence

Determining where workers can move - avoiding contact between different sectors

Setting strict rules for people from outside, e.g. 24 hours of grace period for a person who was on another farm,

48 hours for hunters, forest workers after hunting, working in the forest.

Prevention -mechanical transmission

- Control stable flies (and other flies) by removing dung and compost from the area where the pigs are kept
- Use fly papers or traps, gauze over windows if there is a major problem

Hygiene of footwear, clothing, personal hygiene of persons working on the farm in accordance with written procedures.

Use of separate equipment for each animal production category (zone), its cleaning and disinfection according to recorded procedures.

Use of separate tools, e.g. for dirty work - faeces, dead animals and clean animals - straw, hay.

European Commission

1. dirty boots

2. rinsed with water

3. disinfected

Source: ILVO

ILVO

UNIVERSITEIT GENT

Artificial insemination as element of biosecurity

Semen

Bacterial contamination, e.g. with leptospires or brucellosis, but mainly through faecal contamination

Viruses biger risk - pigs – PRRS, CSF, Parvovirus, Circovirus type 2.

Partial protection by antibiotic but the most important is strict surveillance in semen collection centres.

If impossible use healthy boars from well know sources.

Surrounding of the holding

Distance from other farms and their size - over 3 km low risk for most airborne diseases.

Density of animals in the area up to 100 pigs/km2 - safe stocking density. More than 1000 animals at high risk.

Types of farms in the area.

Slaughterhouses, combs including old ones, landfills, sewage treatment plants - high risk less than 1 km.

Roads - it should be at least 50 m.

Transport

Control of movement of means of transport.

Division of the farm into zones

for internal and external animal transport,

for the transport of feed,

for the transport of fallen stock - no entry to the farm.

Control of bird incursion

Airtight in all openings,

Installation of protective nets - windows, fans,

Feed and grain protection,

Establishing „barriers" in places where birds can sit.

Veterinary practitioners

Appropriate behaviour in accordance with biosecurity standards on farms or internal standards of veterinary service, code of good veterinary practice.

Use of disposable materials or one needle per pig when treating or vaccinating, particularly if more than one herd is being injected;

needles can be sterilized by boiling them for 15-20 minutes

Use only properly decontaminated or sterile equipment,

Involving prepared assistants,

Hygiene of hands, shoes, clothes,

Administration of drug solutions from reusable packaging.

Disinfection

Acids - peracetic acid

Alkali - sodium hydroxide, potassium hydroxide, quick lime, calcium oxide

Aldehyde - glutaraldehyde, formic.
Phenols - lysol, lisoform, kreolina.
Quaternary ammonium alkali - amphoteric detergents

Multi-component compounds – eg. Virkon, Lysoformin, Desoform, CID 20 – surface-active compounds, active substances, organic acids, glycosal, etc.

Disinsection

Mechanical:

adhesive traps with food attractant (traps),

pheromone traps,

Insecticide lamps,

Gel preparations

Disinsection - a set of measures taken to destroy harmful flying insects, arachnids and mites.

Contact, food, respiratory and repellents insecticides.
Chemical:
inorganic - boric acid, silica,
polychloride hydrocarbons - methoxychlorine, pertan,
organophosphorus - propetamphos, chlorpyriphos,
carbamide - bendiocarb, carbaryl, propoxur,
pyrethroids and pyrethrines - permethrin, deltamethrin, cypermethrin,
Insect development regulators -metoprene,
chitin synthesis inhibitors

To be taken into account:

Humidity, temperature,

Construction of walls, floors,

Location of manure, slurry - necessity to use larvicides

Appropriate preparation of buildings for disinsection procedures.

Application of alternate preparations 1-2 times organophosphorus - 1-2 synthetic pyrethroids, simultaneously Neporex every 3-4 weeks.

Attention of bio resistance

Rodencitide control

exterminating rodents, mainly rats in an organized way.

A colony of 100 rats eats more than 1 tonne of feed/year

Rat, mouse can destroy 10 x more feed than eaten -urine, faeces, hair.

Destruction of buildings - wood, wires, thermal isolation,

Animal distress.

Two pillars of disinfestation :

Prophylaxis - no access to food and water, no nesting, presence monitoring, determination of positive and negative traces, maintaining order around livestock buildings.

Extermination -mechanical (traps), electronic (sonic, flashing, ultrasonic repellents),chemical (poisons), anticoagulation rodenticides inhibit prothrombin production in the liver, damage to blood vessels - several days of accumulation. Rodenticides from vitamin D3, toxic after accumulation leads to hypercalcemia and hyperphosphatemia - 7-14 days.

Strategic approach to the management of African Swine Fever for the EU
(Working Doc. SANTE/ 7113/215-Rev - 10)

Pig farms are classified in three categories:

A. Non- commercial farms (NCF): farms where pigs are kept only for fattening for own consumption and neither pigs nor any of their products leave the holding.

B. Commercial farms (CF): farms which sell pigs, send pigs to a slaughterhouse or move pig products off the holding.

C. Outdoor farms: pigs are kept temporarily or permanently outdoor

Minimum biosecurity requirements for each category are defined

https://ec.europa.eu/food/sites/food/files/animals/docs/ad_control-measures_asf_wrk-doc-sante-2015-7113.pdf

34

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Minimum biosecurity requirements for non commercial farms

a) No swill feeding and safety disposal of animal by-products
b) No contact between the pig(s) of the NCF, pigs from other holdings and feral pigs or wild boar. Pigs should be kept in a way that ensures that there is no contact with pigs from other holdings or with pigs outside nor with wild boar.
c) No contact to any part of feral pigs (including hunted or dead wild boar/meat/by products).
d) The owner should take appropriate preventive measures: change clothes and boots. Disinfection should be performed at the entrance of the holding and the stable.
e) No hunting activity should be carried out 48h prior being in contact with pigs.
f) No unauthorized persons/transport are allowed to enter the pig stable and records are kept of people and vehicles entering the holding.
g) Home slaughtering is only under veterinary supervision.
h) No sows and/or boar used for reproduction are allowed on the holding
i) Commercially traded crops, vegetables, hay and straw have a very low ability to contain ASFV. If the use of locally harvested grass and straw is considered to represent a risk under local prevailing conditions, a treatment has to be applied: 1) grass or grains stored for at least 30 days before feeding, 2) straw stored for at least 90 days before use.
j) Farms buildings should:
- ✓ be built in such a way that no feral pigs or other animals (e.g. dogs) can enter the stable.
- ✓ Allow for disinfection facilities for footwear and clothes at the entrance into the stable.

Strategic approach to the management of African Swine Fever for the EU (Working Doc. SANTE/ 7113/215-Rev - 10)

Double fence around farm with outdoor keeping pigs

but

Outdoor keeping of pigs is banned in the area where ASFV has been reported.

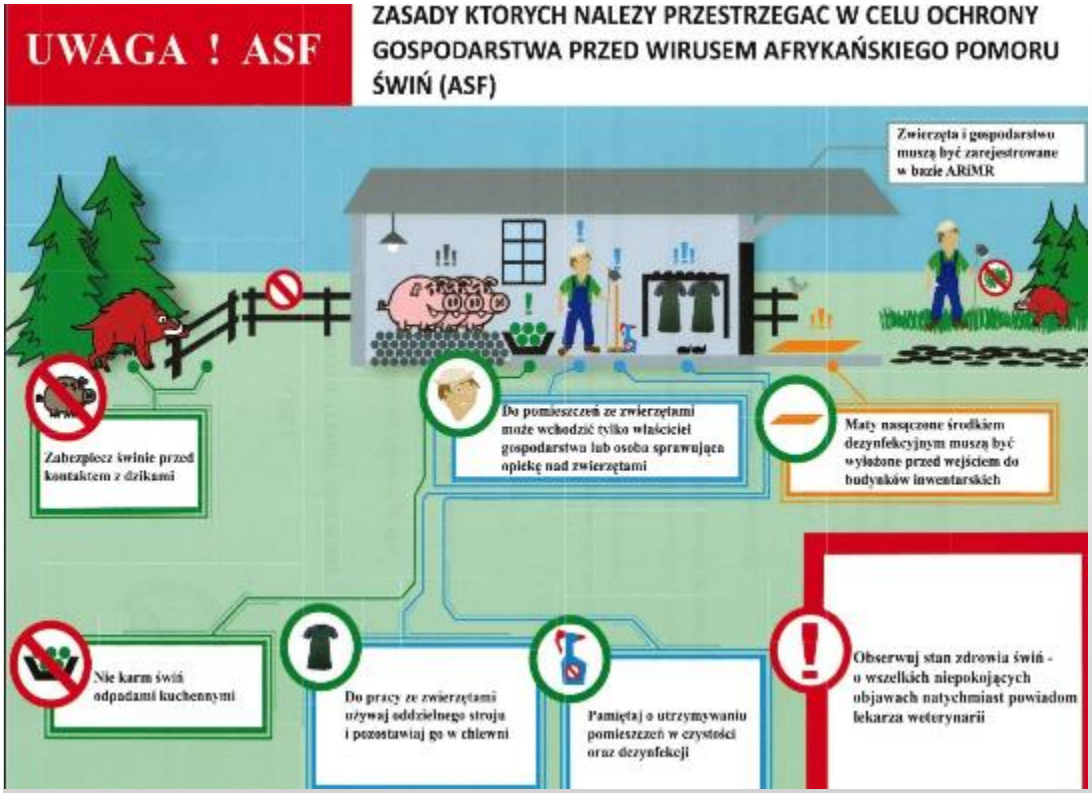
Surveillance in the Infected Area Passive Surveillance

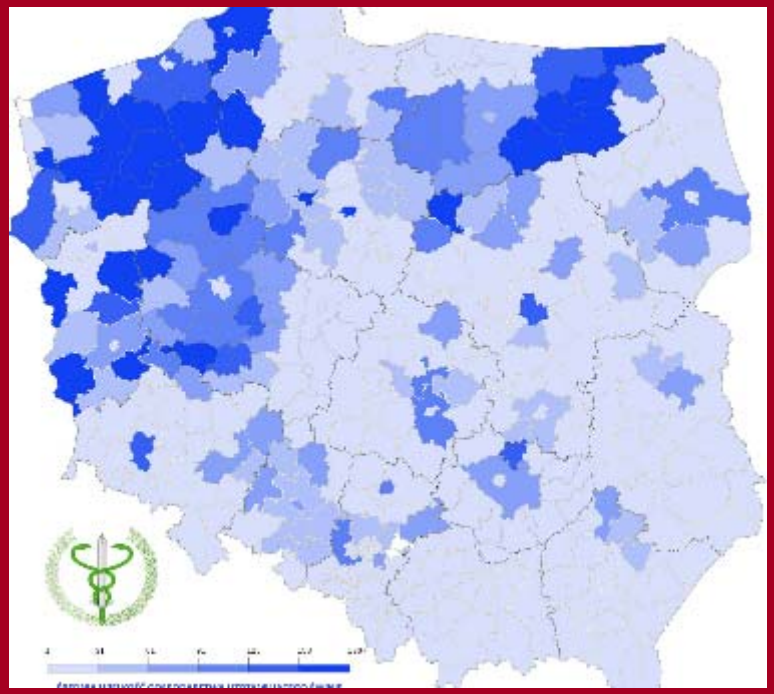
Key role in Early Detection Due to the characteristics of ASF: Morbidity, Lethality BUT

- **Feral pigs**
- Animals sick or found dead (virological tests)
- Serological monitoring of shot animals (evolution of the disease)
- Inspection of places at high risk (WB collection points)

- **Domestic pigs**
- Strict health monitoring programme (all pigs sick/dead examined and tested for ASF)
- Vet inspection on pig slaughtering for own consumption

Awareness compains





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