



# GF-TADs

CADRE MONDIAL POUR  
LE CONTRÔLE PROGRESSIF DES  
MALADIES ANIMALES TRANSFRONTALIÈRES



Organisation des Nations Unies  
pour l'alimentation  
et l'agriculture



Organisation mondiale  
de la santé animale  
Fondée en tant qu'OIE

Union  
Africaine 



# FEED AND SWILL FEEDING

## A BIOSECURITY CHALLENGE IN SMALL-SCALE CONFINED PIG PRODUCTION

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## Some important scientific considerations related to the ASFV

- ▶ Several experimental studies have demonstrated that transmission of ASF V *via* contaminated feed is possible;
- ▶ knowledge is relatively poor concerning fomite-to-pig transmission
- ▶ An *in vitro* study published in 2018 demonstrated that artificially ASFV-contaminated feed ingredients had viable virus pathogens for at least 30 days (2)
- ▶ the study demonstrated that a liquid diet has a much higher infection probability compared with dried feed (4)
- ▶ swill feeding is still a common practice all over the world, especially in free-ranging and backyard farms (4)



- ▶ In 2012, an epidemiological study along the Kenya-Uganda border indicated that the major risk factor highly associated with ASF occurrence was feeding of pigs with swill in smallholder pig farms (2)
- ▶ Frozen raw meat and organs provide ASFV viability for periods lasting from 103 to 118 days,(7)
- ▶ but according to Adkin.*et al.* (8) ASFV may remain infectious for even up to 1,000 days.
- ▶ In meat stored at 4-8° C, a viable virus could be detected over 84- to 155-day periods (8).
- ▶ Infected spleen samples stored in a refrigerator remained infectious for 204 days and 280 days when buried in soil in June at 8 cm depth, 180-188 days in bone marrow and boned meat, 300 days in skin and 105 days in offals however the temperature at which these samples were stored was not stated despite its being a key factor for virus survivability (8).



## participatory risk analysis (workshop on biosecurity building capacity of pig farmers) (9)

- ▶ In practical terms, pig production is the use of pigs for the conversion of waste or residues from agriculture, agri-food industry and human food into pork or financial resources.
- ▶ The 3 fundamental elements are :
  - The animal/genetic resources,
  - Housing/Environnement,
  - **And feed/feeding.**
- ▶ The classification of the type or production system is based on these three fundamentals. Performance depends on the effort that is devoted to improving these three elements combined and managing them well.

## General characteristics of pig production system in Cameroon (9)

Scavenging pigs

**Small-scale confined pig production**

Large-scale confined pig production

- Attempt to mobilize own resources
- Gradual conversion to captive mode
- Alignment with sanitary emergency
- New initiative with limited resources

- insufficient resources
- No or weak financial support
- No insurance
- No savings to devote to business, in favor of an awareness-raising operation for the control or prevention of outbreaks
- in general secondary activity



Small-scale confined pig production

semi-intensive backyard production



small-scale intensive production



multi-species integrated production





Small-scale confined pig production

The approximate habitat

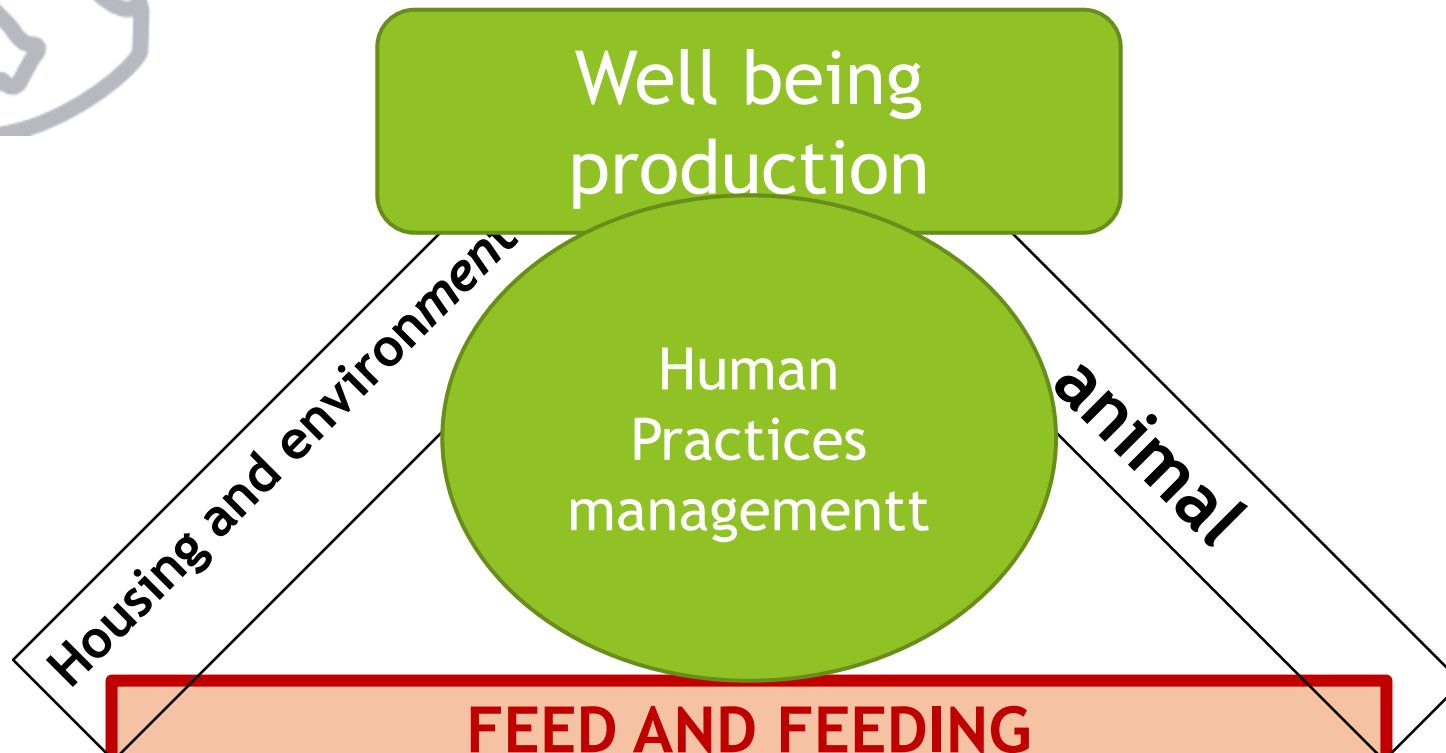
Improve genetic material or pure exotic breed

feed not very accessible, not very available, insufficient or unsatisfactory





# IMPORTANCE OF BIOSECURITY IN FEEDING OF SMALL-SCALE CONFINED PIG



## FEED AND FEEDING

- Account for 60-75% of cost;
- Cause 90% of contact between the pig indoor and the farmer;
- Cause 75% of relation between in and outside the farmer

This observation made in a participatory manner with pig farmers in sub-Saharan Africa illustrates the importance of food and feed as a major risk factor for the spread of contagious swine diseases in this environment.

For less well-off farmers, crops residues and swill are the immediate solution

Tuber  
Roots ei:  
cassava,  
potatoes,  
macabo, taro

Fruits :  
bananas,  
papayas,  
mango,  
pineapple

Cereal haulms  
and green grass  
legumes  
palm nut pulp

swill





The scientific literature recommends heat treatment:

- 60° C for 20 minutes (WOAH, 2022)
- 5 à 10 at boiling point (Nuanualsuwan et al., 2022)

Possibility of contamination by wildlife or scavenging carrier pigs of agricultural residues

Considerable risk

Contamination by initially infected pork when found in table and kitchen waste

2 constraints for implementing this solution:

- It takes time to carry out this boiling task every day
- Access and availability of fuel

# The consequence of crops residues and swill feeding



Low yield



Difficulty in management

Under feeding or malnutrition

High disease risk



For the most well-off farmers and those in peri-urban areas, cereals and agro-industrial byproducts are the most used

Cereal and cereal by products (Maize, sorghum, wheat and rice bran, etc;

Cottonseed groundnut soybean cake, etc.

Blood, bone and fish meal, crayfish waste, and shellfish

Brewerie spent grain and yeast





In relation to biosecurity, 2 supply and distribution pathway are known

1- The short pathway concerning high scale pig production with less ASF risk

Food industries

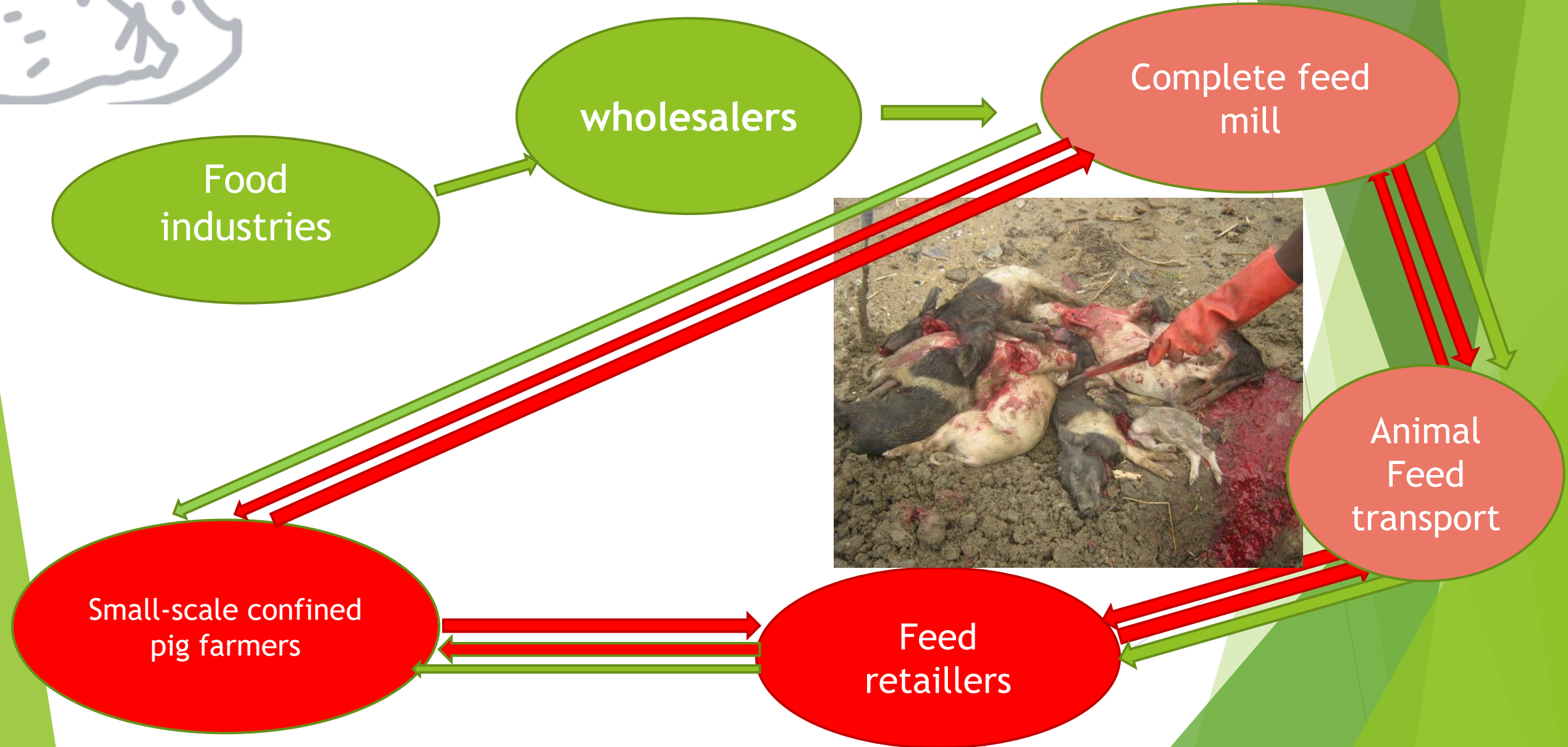
wholesalers

Industrial farms



This is the pathway with the lowest ASF contamination and spread risk, because it concerns farms with the highest standards

# The long pathway dealing with Small-scale confined pig production





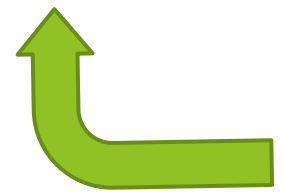
The dry long pathway of feed supply and distribution







The moist and long pathway of feed supply and distribution





## AS A REMINDER FROM THE WOAH TERRESTRAL CODE

### Article 15.1.22. (SWILL)

Procedures for the inactivation of ASFV in swill:

1. Heating of at least 90° C for at least 60 minutes, with continuous stirring;
2. maintained at least 121° C for at least 10 minutes at an absolute pressure of 3 bar;
3. an equivalent treatment that has been demonstrated to inactivate ASFV.

### Article 15.1.23. (MEAT)

For the inactivation of ASFV in meat, it should be subjected to heat treatment for at least 30 minutes at a minimum temperature of 70° C, which should be reached throughout the meat;



FAO recommended a heat treatment of swill to inactivate ASFV at a temperature of 70°C for 30 min (FAO, 2017)

Recent studies have suggested that the virus is inactivated by cooking for **5-10 minutes at boiling point (Nuanualsuwan et al., 2022)**



## CONCLUSION

According to the above slides, In feeding chain, vehicle for feed transport and stakeholder behaviors seems to play greater dissemination role (but scientific evidence in subsahara situation is still to be explored)



1

Pigs feeding in the small-scale confined pig production system is one of the most important risk factors in the spread of ASF in sub-Saharan Africa.

2

The economic situation, in limited financial resources settings, constitutes the factor of aggravation of the risk and constraints for the respect by farmers of classical recommended biosecurity rules

3

Very few solutions are proposed by the scientific literature. It is absolutely necessary to look into it for effective control of ASF in low resource setting in Africa



## SUGGESTIONS

1

A special attention should be paid in the involvement of all the stakeholders in improving biosecurity in the different feed supply and distribution pathways as much as the value chains are today taken into account.

2

More effort should be made in exploring more suitable solutions for biosecurity along the different pathways of pig feed supply and distribution



THANK YOU FOR COMING TOGETHER FOR  
APPROPRIATE SOLUTIONS IN BIOSECURITY IN PIG FEED  
SUPPLY PATHWAYS IN LOW RESOURCE SETTINGS





## Some related references

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