



U.S. SOY for a growing world

AFRICAN SWINE FEVER: WHAT FEED MANUFACTURES AND INGREDIENT SUPPLIERS NEED TO KNOW AND HOW TO ACT

with focus on recent outbreaks in Europe

Dr. Iani CHIHAIA
President

Romanian Feed Manufactures Association ANFNC

USSEC SEMINAR

Akasaka Intercity Conference ; TOKYO, JAPAN

October 17th, 2019

AFRICAN SWINE FEVER: WHAT FEED MANUFACTURES AND INGREDIENT SUPPLIERS NEED TO KNOW AND HOW TO ACT

with focus on recent outbreaks in Europe

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TAKE AWAY
MESSAGES

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AFRICAN SWINE FEVER: A GLOBAL AND EUROPEAN VIEW OF THE CURRENT CHALLENGE

ASF has the potential to dramatically disrupt and change the global protein production, consumption and meat trade flows

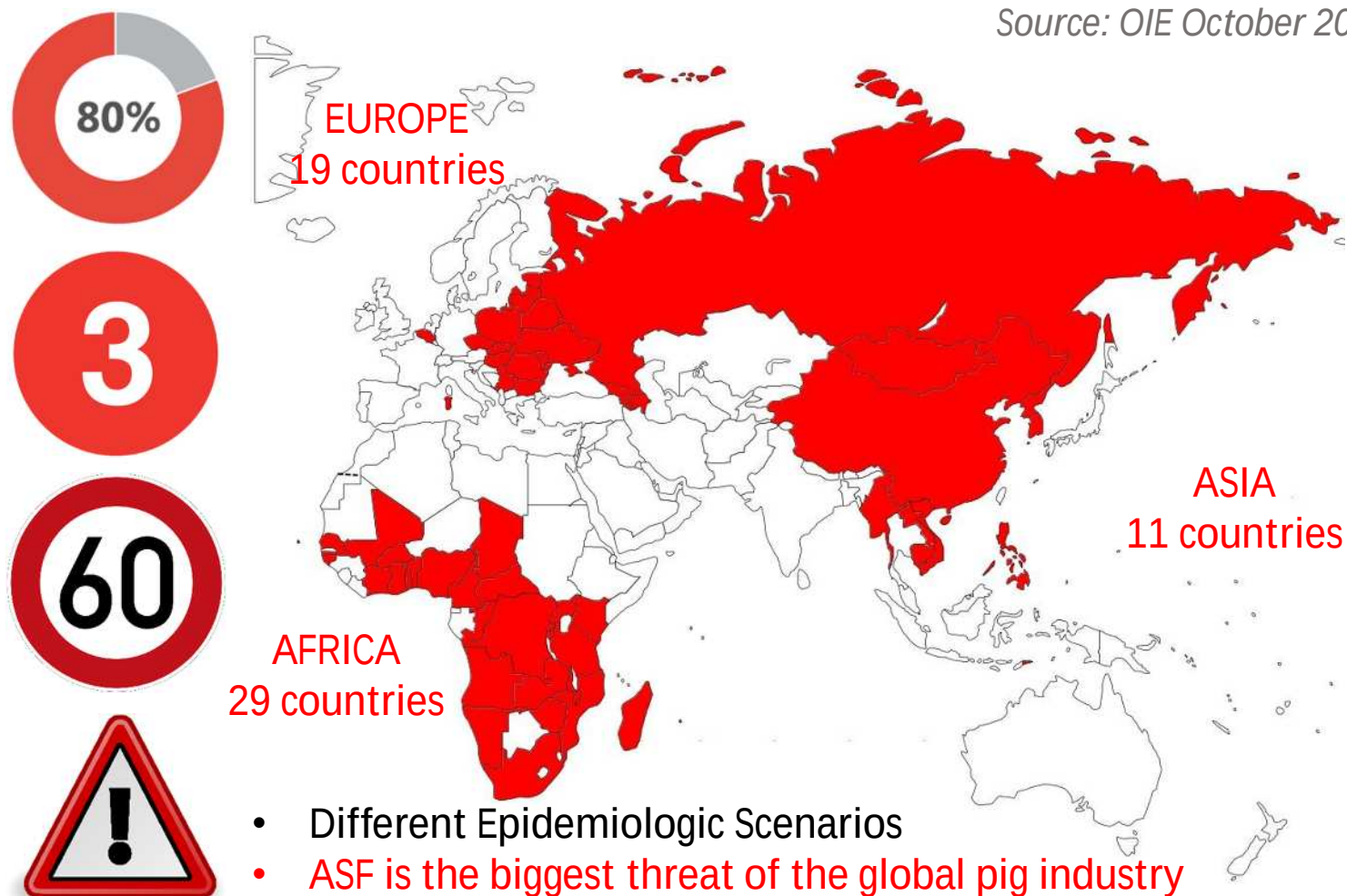
AFRICAN SWINE FEVER: A GLOBAL VIEW OF THE CURRENT CHALLENGE

PAST: Prior 2007

- African swine fever has been reported in **60 countries** since it was first observed in 1921.
- Only **13 countries** have eliminated the disease, after fighting it for as long as **36 years**.
- There have been over 360,000 cases of ASF in 2018 and 19 countries have been affected.

PRESENT : October 2019

Source: OIE October 2019



HUMAN INATTENTION IS DRIVING THE ASF EPIDEMIC



“What we’re seeing so far is just the tip of the iceberg.

The emergence of the disease in other countries will almost certainly occur.”

September, 2018



Food and Agriculture Organization
of the United Nations



Juan LUBROTH
Chief Veterinary FAO, Rome

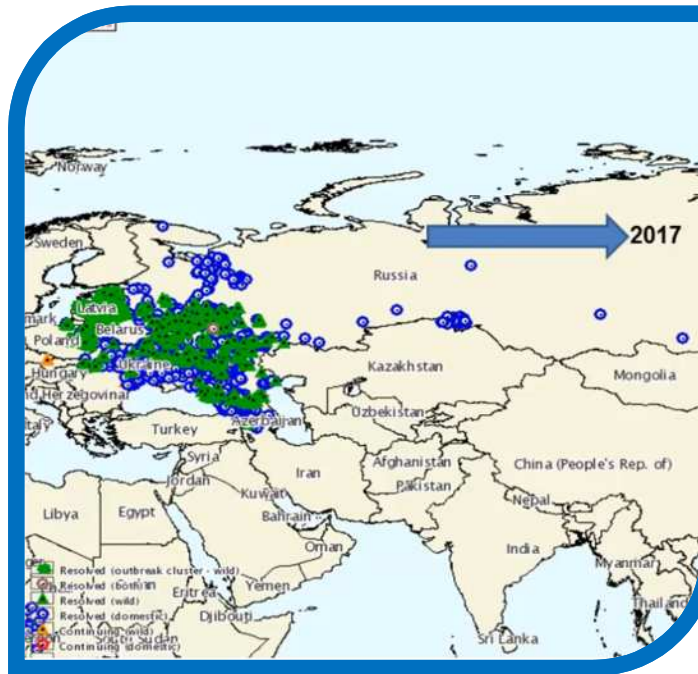
HUMAN INATTENTION ROLE IN SPREAD OF THE ASF VIRUS

FROM EASTERN AFRICA TO CAUCASUS AND THEN CENTRAL AND NORTHERN RUSSIAN FEDERATION, EUROPE AND ASIA

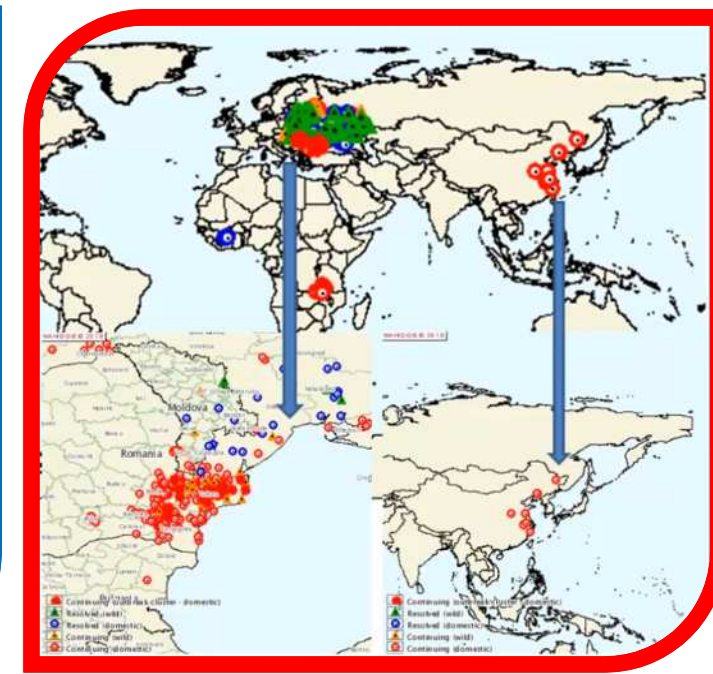
2007



2011 - 2017



2018

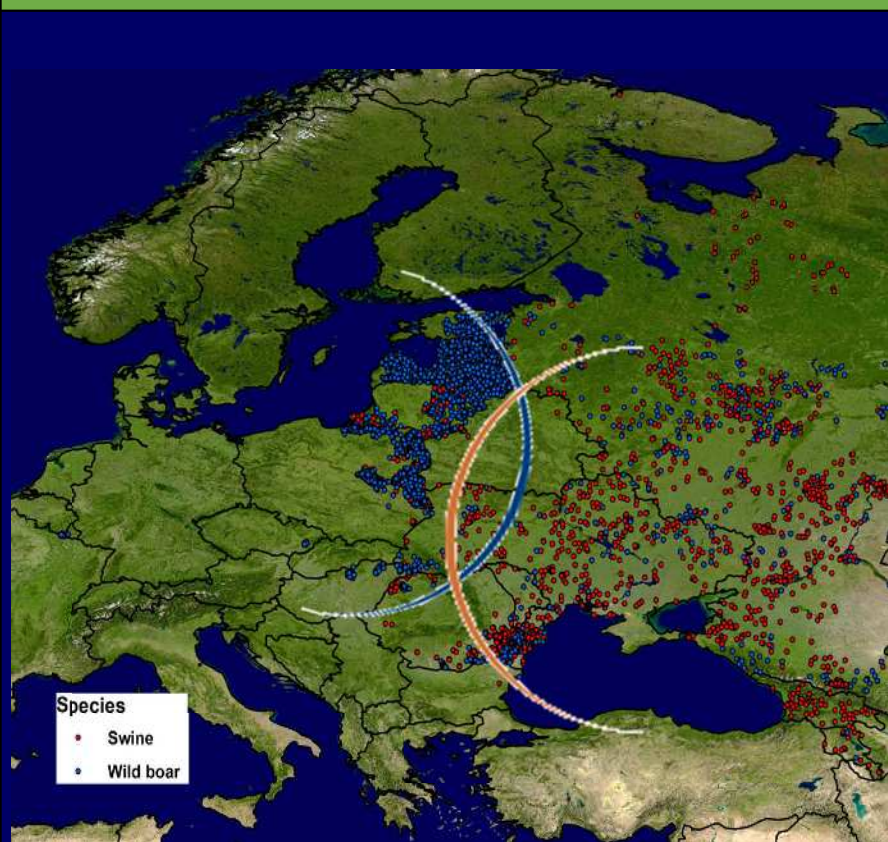


- Since 2007 nearly 1 million pigs in Europe have been culled for ASF.

AFRICAN SWINE FEVER: CURRENT SITUATION IN EUROPE - OCTOBER 2019

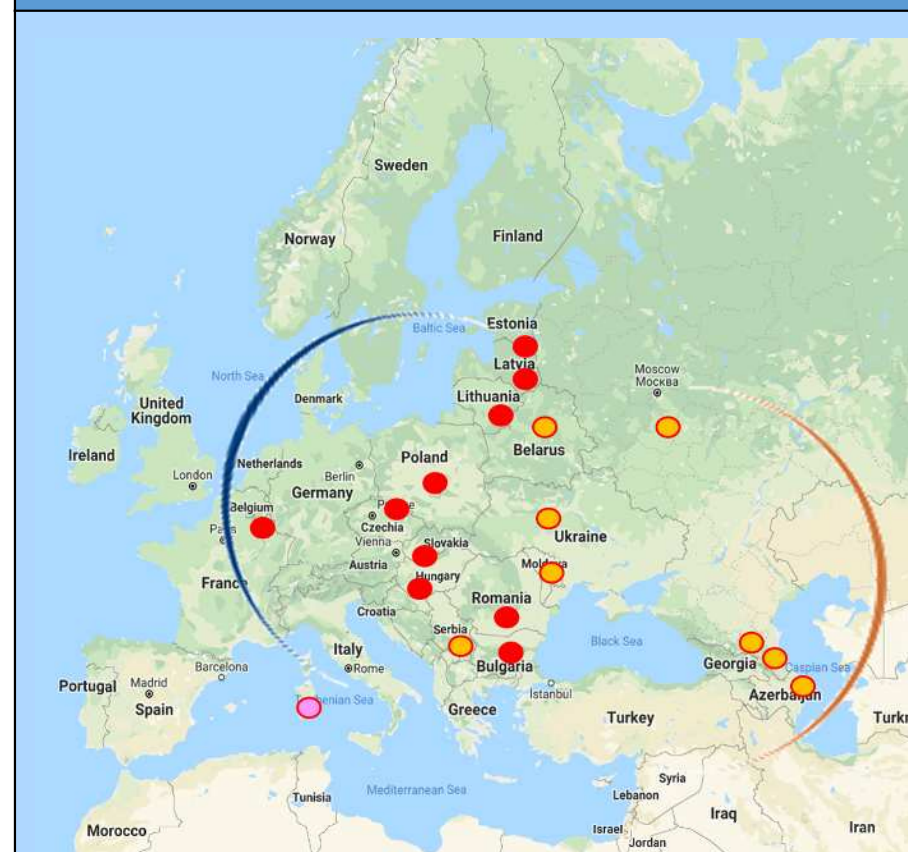
COUNTRY	YEAR
Georgia	2007
Armenia	2007
Azerbaijan	2007
Russia	2007
Ukraine	2012
Belarus	2013
Estonia	2014
Latvia	2014
Lithuania	2014
Poland	2014
Moldova	2016
Romania	2017
Czechia	2017
Hungary	2018
Bulgaria	2018
Belgium	2018
Serbia	2019
Slovakia	2019
IT Sardinia*	1978

ASF SPREAD FROM EAST TO WEST EUROPE



- Lack of knowledge; There is a lot of underreporting going on
- Absence of good management leads to further spread
- Situation in wild boar is often unknown: endemic disease?

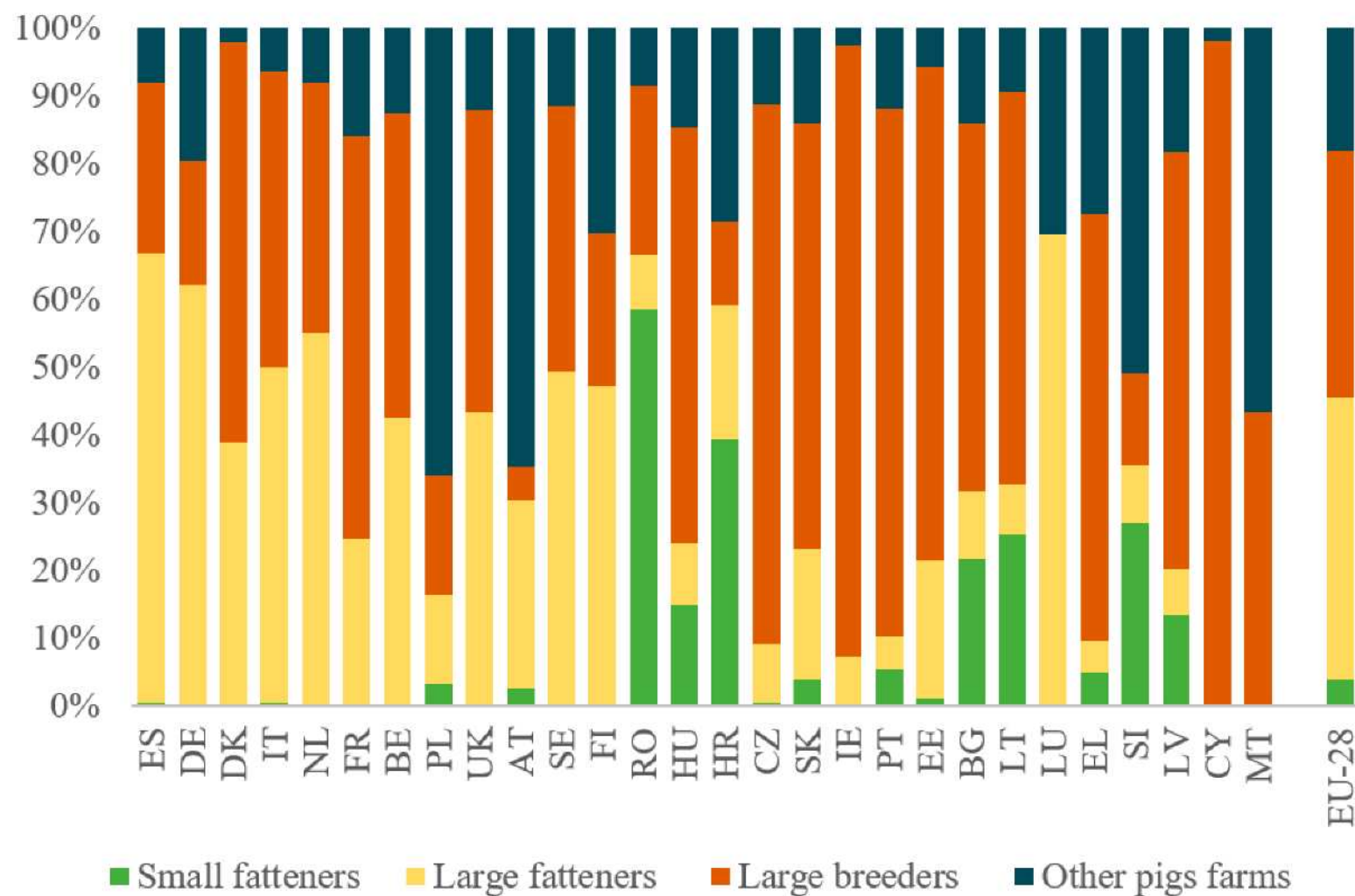
19 EUROPEAN COUNTRIES : EU AND NON EU



- 7 out of 19 EU countries reported ASF infection in wild boar
- 6 out of 19 EU countries reported in domestic pigs as well
- Lack of legislation ; Conflicting EU, National and Non EU

Adapted from : Vizcaino, J.M. , 2019

DISTRIBUTION OF PIGS BY THE TYPE OF PIG FARM IN THE EU 2014



Source: Eurostat. *Pig Farming in the European Union: Considerable Variations from One Member State to Another. Issue 15. 2014a.* Available online: <http://ec.europa.eu/eurostat/web/products-statistics-in-focus/-/KS-SF-14-015> (accessed on 4 February 2019).

ASF OUTBREAKS PATTERNS AS REPORTED IN EU AND NON EU COUNTRIES

WILD BOAR OUTBREAKS DOMESTIC PIGS OUTBREAKS

Adapted from : Vizcaino, J.M. , February 2019

BELGIUM

100%



CZECHIA

100%



HUNGARY

100%



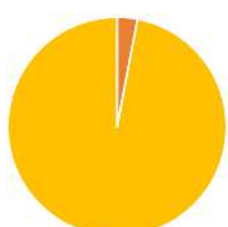
BELARUS

100 %



LATVIA

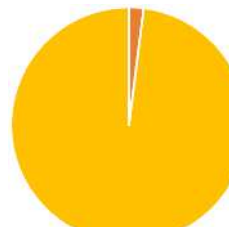
3 %



97 %

ESTONIA

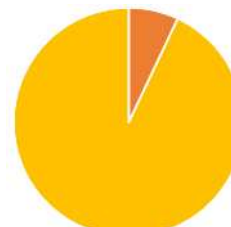
2 %



98 %

LITHUANIA

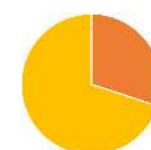
7 %



93 %

RUSSIA

30 %



70%

UKRAINE

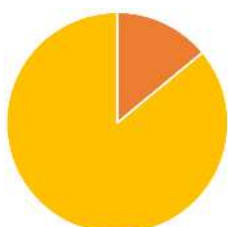
21 %



79%

BULGARIA

14 %



86 %

POLAND

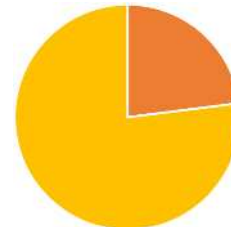
6 %



94 %

ROMANIA

23 %



77 %

MOLDOVA

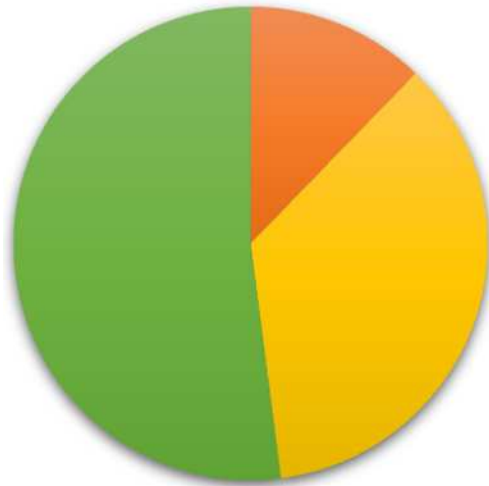
33 %



67 %

REPORTED ASF OUTBREAKS IN DOMESTIC PIGS POPULATION EXAMPLE OF EU AND NON EU COUNTRIES

RUSSIA



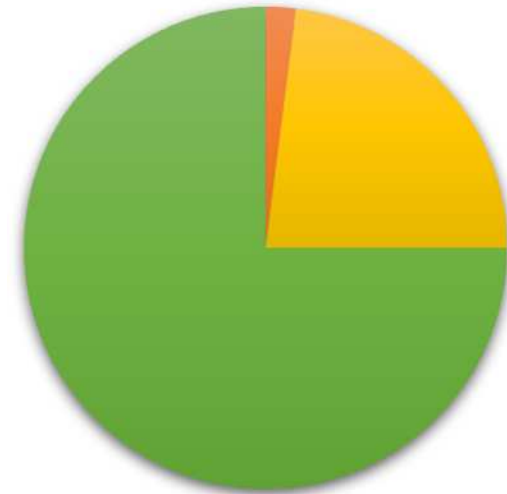
FAMILY FARMS: less than 15 animals

MEDIUM FARMS: 15 – 500 animals

INDUSTRIAL FARMS: more than 500 animals

From : Vizcaino, J.M. , February 2019

ROMANIA



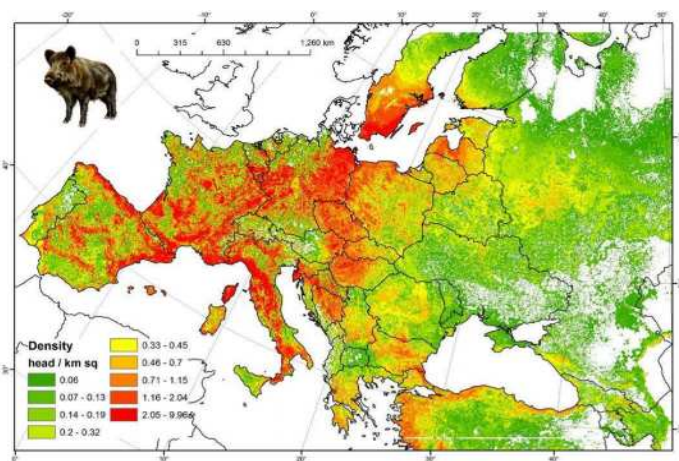
ASF Status in Romania, 25th September 2019

- 346 localities of 26 counties (out of total 41 counties)
- 1.223 outbreaks (13 commercial and 6 type-A farms)
- New wild boars cases in another 3 counties
- 481.921 pigs were sacrificed in total
- 2.126 cases in wild boar populations

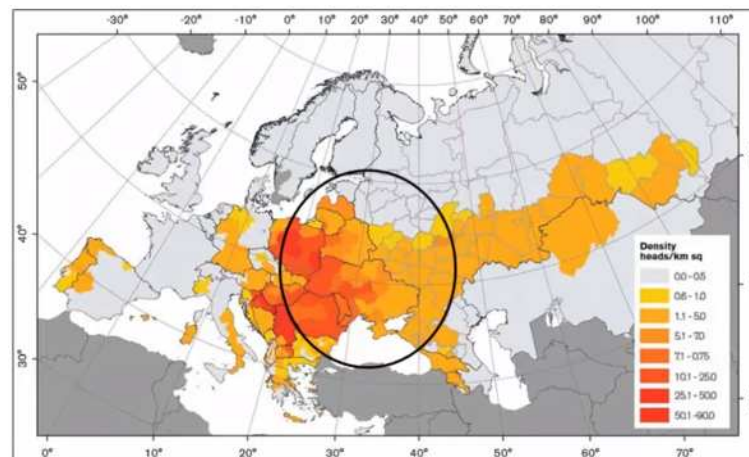
From : ANSVSA, September 2019

“INGREDIENTS OF THE RECIPT” FOR ASF VIRUS SPREAD IN EUROPE

MODELLED WILD BOAR POPULATION DENSITY IN EUROPE



DENSITIES OF DOMESTIC PIGS IN THE LOW BIOSECURITY AREAS OF EUROPE



RESULTS FROM STUDY IN RUSSIA ASF SPREAD 2007 - 2012

SOURCE OF INFECTION	NUMBER	PERCENT
Trade of infected pigs	1	0.3
Direct contact between neighboring farms (backyard)	5	1.7
Contaminated food waste brought by farm personnel	1	0.3
Contaminated vehicles	108	38.0
Contract with wild boars	4	1.4
Feeding contaminated feed	100	35.0
Not defined	65	23.0

Adapted from various statistics 2008 – 2011: FAO/EMPRESS; ASF TASKFORCE 2015

Adapted from : Belyanin, 2013

WILD BOAR - A HIGHLY INVASIVE SPECIE PRESSURING WEST AND EAST EUROPE



2

WHY THE FUSS ?

African swine fever threatens a major food source and billions of dollars in international trade.

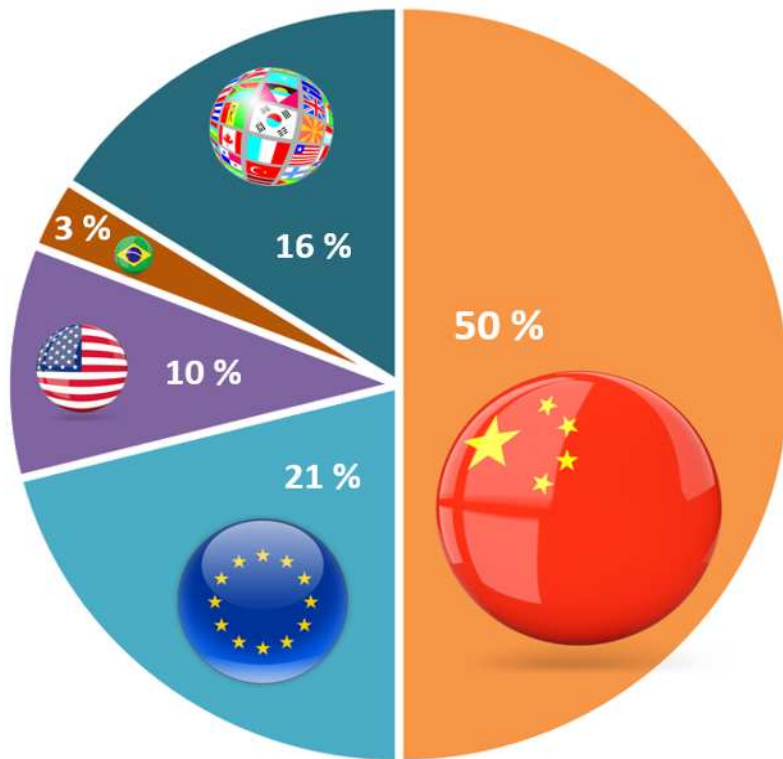
U.S. SOY for a growing world

WHY THE FUSS?

Data adapted from: Pork.org and Rabobank

WORLD MEAT CONSUMPTION SHARES AND TOP 5 PORK MEAT PRODUCTION COUNTRIES

PRIOR ASF CRISIS (2016)



PORK MEAT GLOBAL TRADE PRIOR ASF CRISIS (2016)

No	COUNTRY	US\$	%
1	Germany	4.8 BN	15.8
2	USA	4.6 BN	15.2
3	Spain	4.1 BN	13.5
4	Denmark	2.7 BN	9.1
5	Canada	2.5 BN	8.4
6	Netherlands	2.2 BN	7.2
7	Brazil	1.5 BN	4.9
8	Belgium	1.4 BN	4.8
9	Poland	1.1 BN	3.5
10	France	932.9 MN	3.1
11	Mexico	527.6 MN	1.7
12	Ireland	502.6 MN	1.7
13	Austria	433.5 MN	1.4
14	Hong Kong	427.2 MN	1.4
15	Chile	396.5 MN	1.3

Pork exports make up 8.5% of the EU's total agricultural industry and over 60% of the bloc's total meat exports.

Q3 2019: Highlights on the changing Global Pork Market

Source : King J, July 2019

CHINA

- Live hog prices are finally moving higher, indicating tight supply.
- Pig herd losses growing.



USA

- Pork production in the second half of 2019 is expected to rise, driven by a large breeding herd and improvement in productivity.
- The labor shortage remains a key constraint in the second half of 2019.



BRAZIL

- Exports are increasing, driven by Chinese and Russian demand.
- Domestic pork prices are rising, as exports are outpacing production growth.



EUROPE

- ASF in Eastern Europe remains pressing, discouraging expansion.
- Exports have increased.
- Production not yet responding to price



AFRICAN SWINE FEVER IS CONSIDERED AN EXCEPTIONAL EVENT AT O.I.E.



- O.I.E. has been created in 1924 by 28 countries in response to the Rinderpest epizootic in Europe.
- Today, the OIE has 182 OIE Members (out of 195 countries in total)
- General Mandate: to improve animal health worldwide.



- Significant epidemiological events are notified by OIE Member Countries through immediate notifications are published on receipt as alerts.
- Information can be accessed the OIE launched the [WAHIS Alerts application](#), which enables disease alerts (immediate notifications) and O.I.E. follow-up reports.
- For year 2019, the notifiable diseases list includes 117 animal diseases, infections and infestations.

- African swine fever is a disease listed in the O.I.E. Terrestrial Animal Health Code
- ASF must be reported to the OIE Terrestrial Animal Health Code

HEPARIN - WORLD WIDE SHORTAGE : ANOTHER PEAK OF THE ICEBERG

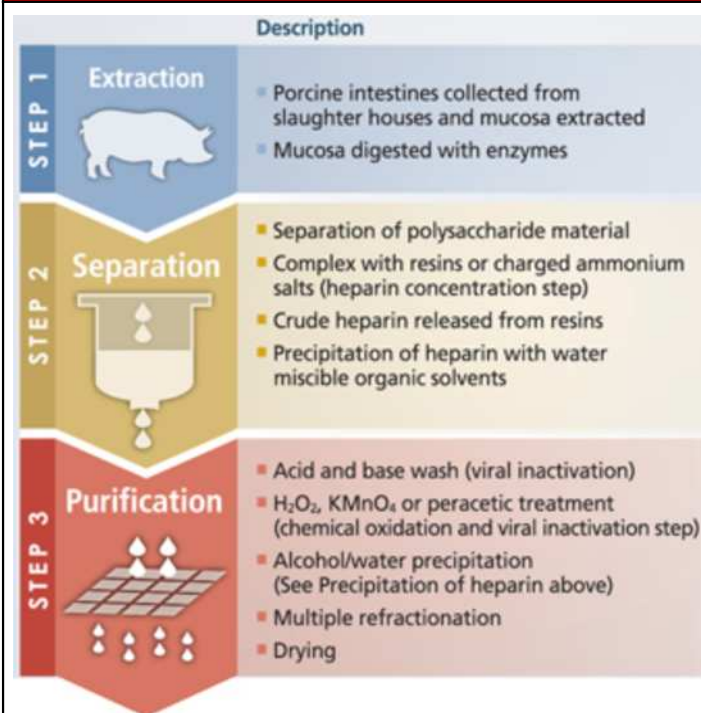
Adapted from: Nature, April 2019

PORCINE HEPARIN



Primary blood thinner
used worldwide

HEPARIN PRODUCTION



Made from boiled pigs'
intestines

SYNTHETIC HEPARIN



Serious
side effects

3

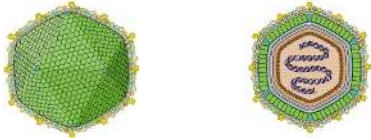
AFRICAN SWINE FEVER VIRUS: THE PATHOGEN, DISEASE RISK FACTORS AND TRANSMISSION CYCLES

ASF is a very patient virus

Human attitude plays essential role in terms of control and in terms of spread

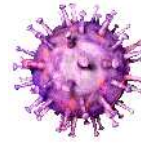
AFRICAN SWINE FEVER VIRUS: THE PATHOGEN, HOSTS AND RESERVOIR

LARGE ENVELOPED VIRUS



Is a DNA virus of the *Asfarviridae* family. Enveloped, 200 nm in diameter with a linear, double-stranded DNA genome that encodes 160 to 175 genes

COMPLICATED DISTINCTIVE MORPHOLOGY



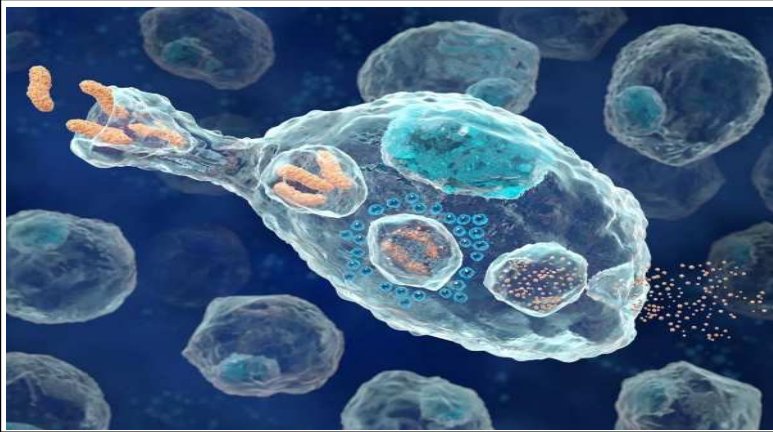
Dense 80 nm virion core that is composed of the viral genome and an icosahedral capsid, covered by an internal lipoprotein envelope

VERY TOUGH



The outer envelope is derived through the budding process from the cellular membrane of infected cells

PORCINE MACROPHAGES



SOFT TICK SPECIES



RESERVOIR



RESISTANCE OF THE ASF VIRUS IN ENVIRONMENT AND IMPLICATIONS FOR DISEASE TRANSMISSION

MEDIUM	T°C	DAYS	References
LIQUID MANURE	17	84	<i>Hass et al, 1995</i>
	4	112	<i>Hass et al, 1995</i>
	4	15	<i>Hass et al, 2015 (in cell cultures)</i>
	37	3	<i>Hass et al, 2015 (in cell cultures)</i>
IN FECES	No	60 - 100	<i>Strauch, 1991; Haas, Ahl et al, 1995</i>
	No	155	<i>Kovalenko et al, 1972</i>
	4 - 6	159	<i>Kovalenko et al, 1972</i>
	4	8	<i>K. Davies et al, 2015 (in cell cultures)</i>
	37	4	<i>K. Davies et al, 2015 (in cell cultures)</i>
BLOOD	No	112	<i>Kovalenko et al, 1972 (on bricks)</i>
	No	81	<i>Kovalenko et al, 1972 (in soil)</i>
SOIL	4	98	<i>Davis et al, 2017 in vitro , DNA in faeces</i>
	4	8.5	<i>Davis et al, 2017 in vitro , DNA in faeces</i>
	12	6.5	<i>Davis et al, 2017 in vitro , DNA in faeces</i>

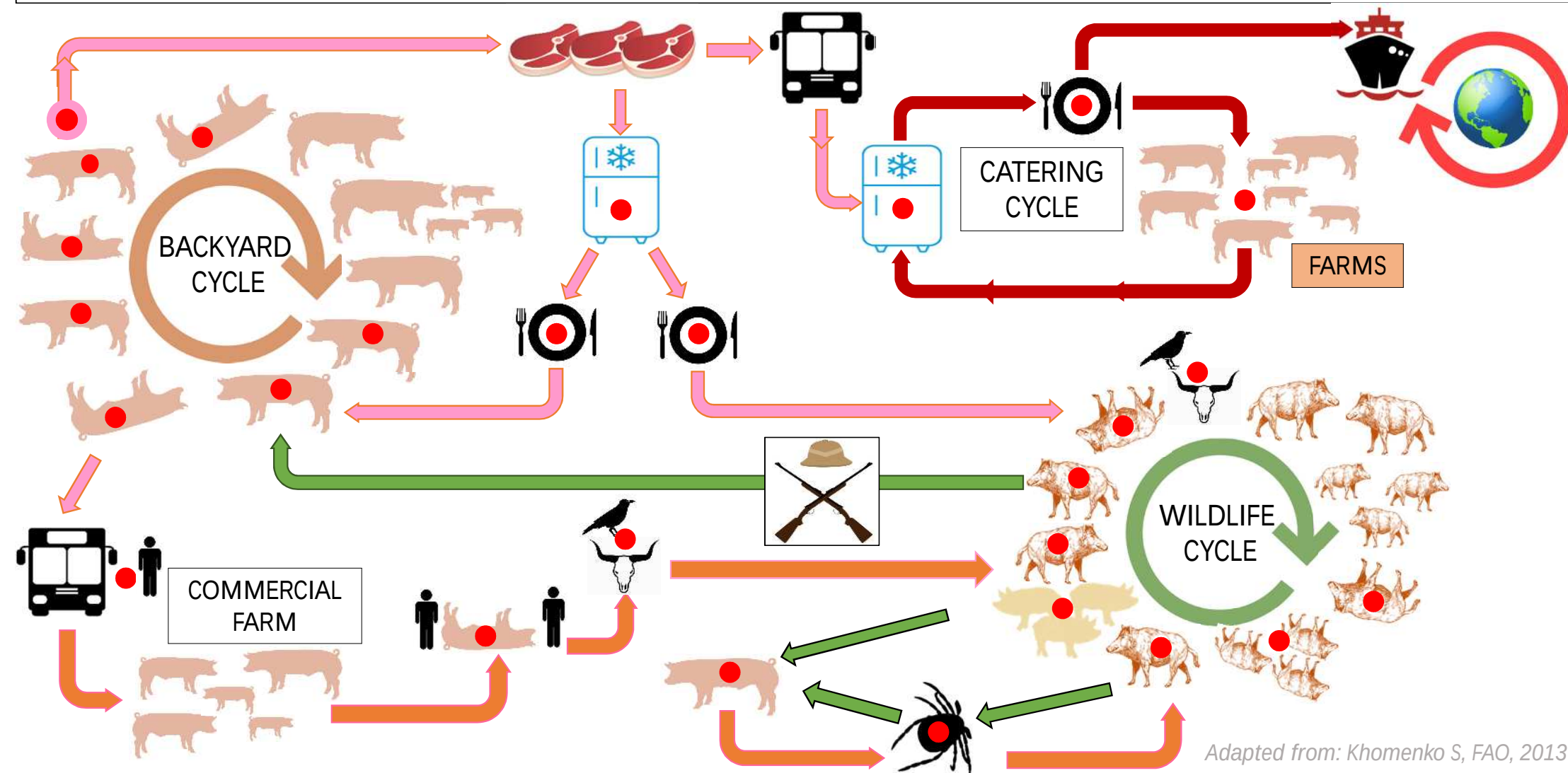
- ASFV is highly stable in proteinaceous environments and quite resistant to high temp, requiring 60°C for 20 min for inactivation.
- In uncooked pork survives 6 months ; Dry salted ham 104 days; Frozen meat : 1.000 days / indefinitely

RISK FACTORS INVOLVED IN AFRICAN SWINE FEVER VIRUS SPREAD

Source: FAO

ORAL - NASAL EXCRETES / SECRETES Are likely to be involved in the direct contact spread of the infection Virus is shed for 2 - 4 days	BLOOD Detected in the blood of infected wild boar at 2-5 days post exposure Virus survives months @4°C	RAW MEAT Virus is present in the meat of sick animals too and is resistant to putrefaction Survive for > 3 months	CARCASSES In wild boar cycle, the virus survival in carcasses plays a crucial role It outlives its host
OFFAL In winter, improperly disposed offal has a strong potential to increase risk of spread of the disease Survives viscera, skin, head	FAECES AND URINE Are infectious and the half-life of the virus in them is driven by environmental temperature. For G II = 15 days @4°C/3 days @ 21°C	SOIL Survival of virus in soil is likely dependent on ambient temperature and soil properties After carcass disappeared	SCAVENGING INSECTS Maggots were found to be contaminated with the DNA. (EFSA, 2010, Forth,2018) Infectiousness not proved
HEMATOPHAGOUS INSECTS Stable fly (<i>Stomoxys calcitrans</i>) is considered a mechanic vector (Mellor et al, 1987) Carrying the virus for 48 hrs	ORNITHODORUS TICKS Strongly involved in natural ASF transmission cycle in Africa Do not occur in affected EU	FOMITES Transmission is possible via any fomite (contaminated, non-living, object) capable of carrying infection ↑ Environmental resistance	FOOD / KITCHEN WASTE Thermally untreated food, as well as food leftovers originating from infected animals Long distance spread of ASF

TRANSMISSION CYCLES OF AFRICAN SWINE FEVER IN EURO ASIA REGION INVOLVING LOW BIOSECURITY COUNTRY & PIG PRODUCTION SYSTEMS AND WILD BOAR



4

ASFV TRANSMISSION VIA COMPOUND FEED, INGREDIENTS AND WATER:

What feed manufactures and ingredients suppliers need to know.
The science on viral transmission through feed and feedstuffs is still relatively young.

LESSONS FROM THE OTHER TRANSBOUNDARY AND EMERGING DISEASES: PEDV

2013 USA PORCINE EPIDEMIC DIARRHEA VIRUS



PEDV, killed more than
10 % of the U.S. pig herd.

This costed almost \$2 billion, including
compensations for the farmers

SOURCE OF CONTAMINATION



The source of PEDV contamination
was proved to be
woven plastic bags that are used to
move pig feed ingredients
around the world

DECONTAMINATION AND VIRAL ELIMINATION FROM FEED MILL



Once PEDV is introduced into
a feed mill, there is significant
dissemination of viral RNA
throughout surfaces and equipment
making decontamination and viral
elimination a challenge.

- With PEDV, a dose as low as 200 infectious particles in feed has been demonstrated to result in pig infection.
- An acutely infected piglet can produce 100,000,000 infectious particles per gram of feces.
- Thus, 1 gram of feces from an acutely PEDV infected pig could contaminate up to 500 tons of feed with each gram of feed being infectious.

From : Woodworth, Huss et al., 2017

RISK PROFILE OF DIFFERENT FEED INGREDIENTS (ESTIMATE)

Source: FEFAC, September 2019

PRODUCT	RISK LEVEL	UNCERTAINTY
Gelatin (direct use), rendered fats	Negligible	Low
Collagen, hydrolyzed proteins, blood products	Low	Large
Spray dried blood plasma	Low	Large
Feed additives	Very low	Low
Cereals from infected areas	Low	Large
Forages from infected areas	Medium	Medium
Bedding materials	Medium	Medium





Dr. Megan
NIEDERWERDER
Kansas State
University



October 8th , 2018

"Although feed is a less recognized transmission route for African swine fever, **the global distribution of feed and feed ingredients makes this route important to consider** as a possible factor in transboundary spread.

Our research at KSU is focused on understanding **the role that feed plays in viral transmission, through defining the oral infectious dose and stability in feed ingredients,** and learning what mitigation tools may be utilized to reduce the risk of African swine fever virus introduction into the U.S."



2018 KSU STUDY: FEEDSTUFFS STUDIED THAT HAVE SHOWN THE POTENTIAL TO SUPPORT VIRUS SURVIVAL

Source: Niederwerder, 2018

SOYBEAN MEAL



DDGS



LYSINE HYDROCHLORIDE



CHOLINE CHLORIDE



VITAMIN D



PORK SAUSAGE CASINGS



DRY AND MOIST DOG FOOD



MOIST CAT FOOD



PORCINE BASED INGREDIENTS



OTHER INGREDIENTS CONTINUED TO BE RESEARCHED

- There may be other feed ingredients that were not tested that could support survival of pathogenic viruses.
- Options may include: extended storage times, irradiation, thermal processing, or chemical treatment (formaldehyde, or medium chain fatty acid-based liquids, etc.)

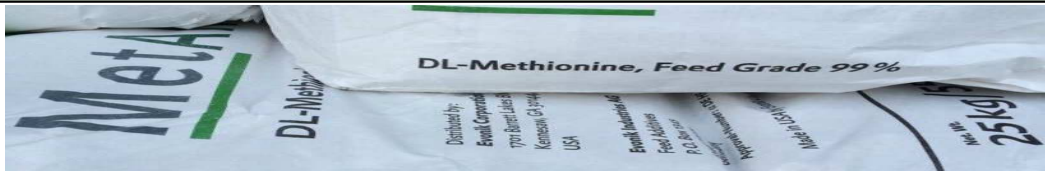
2018 KSU STUDY: HOLDING TIME FOR FEEDSTUFFS MAY REDUCE RISK OF ASFV TRANSMISSION

- This was the first research demonstrating the **ability for certain feed ingredients to support viral survival** under laboratory conditions modeled after either trans-Atlantic or trans-Pacific shipping to U.S. ports and on to locations likely to manufacture feed for swine.

From: Pork.org October 8th, 2018

PACKED FEEDSTUFFS
PRODUCED AND HANDLED
IN SEALED OR SECURE BAGS OR CONTAINERS

VITAMINS, MINERALS AND AMINO ACIDS



USE IS SAFEST
78 DAYS
AFTER A 'BORN ON' DATE

BULK FEEDSTUFFS
PRODUCED AND HANDLED IN NON-SEALED
OR NON-SECURE CONTAINERS, TOTES

SBM, DDGS



USE IS SAFEST
286 DAYS
AFTER A 'BORN ON' DATE
if shipped in a way to prevent additional contamination



Feedstuffs in either category may be produced under biosecure, non-biosecure or unknown conditions



2019 KSU STUDY : Infectious Dose TCID₅₀ of ASFV When Consumed Naturally in Liquid or Feed

EXPERIMENTAL SETUP

- 68 healthy crossbreed pigs
- 52 days of age
- Biosafety level 3 containment facility
- 7 separate replications at the different doses
- TCID₅₀= Tissue culture Infective Dose (virus titer)

<https://dx.doi.org/10.3201/eid2505.181495>

From : Niederwerder, October 2019

GOAL: To determine the TCID₅₀ (minimum and median infectious doses) of the ASFV Georgia 2007 strain through oral exposure during natural drinking and feeding behaviors.

LIQUID

MINIMUM TCID₅₀

10⁰ 50% TCID₅₀

MEDIAN TCID₅₀

10^{1.0} TCID₅₀



FEED

MINIMUM TCID₅₀

! 10^{1.0} TCID₅₀

MEDIAN TCID₅₀

10^{6.8} TCID₅₀



NO PANIC: PRACTICAL CONSIDERATIONS ON THE REAL PROBABILITY OF ASFV REACHING INFECTING CONCENTRATIONS IN DRINKING WATER

From : Marco E., 1 October 2019

DANUBE LONGEST RIVER IN THE EU

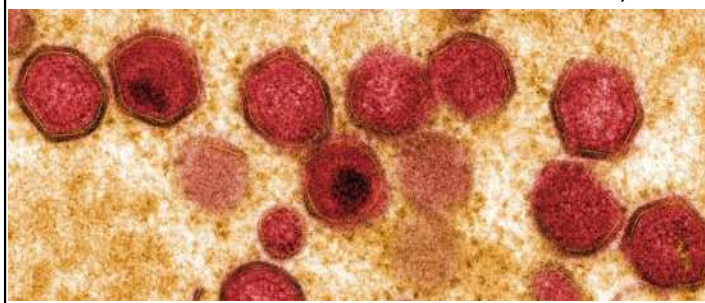


6.500 m³/s
Danube's average flow

BASIC ASSUMPTIONS

- ASFV Dose of 10^1 TCID₅₀
- Concentration ASFV in blood:
 3×10^6 copies/200 microliters
(the same as detected in cases of an acute infection)

Blome et al., 2013



50 kg (with 65 ml blood/kg)
Average weight of the pigs

NO. OF INFECTED DEAD PIGS NEEDED TO INFECT ANIMALS

- Every day, **at least 115 pigs** would fell or would be thrown into the river.
- All the blood contained in their bodies would be diluted in the drinking water.
- The water is not subjected to any disinfection system that could reduce its viral load.

Sanitization of
drinking water is a must

GAPS OF KNOWLEDGE IN THE POTENTIAL ASFV TRANSMISSION WITH ORIGIN IN CONTAMINATED FEED AND FEED INGREDIENTS

Update: September 2019

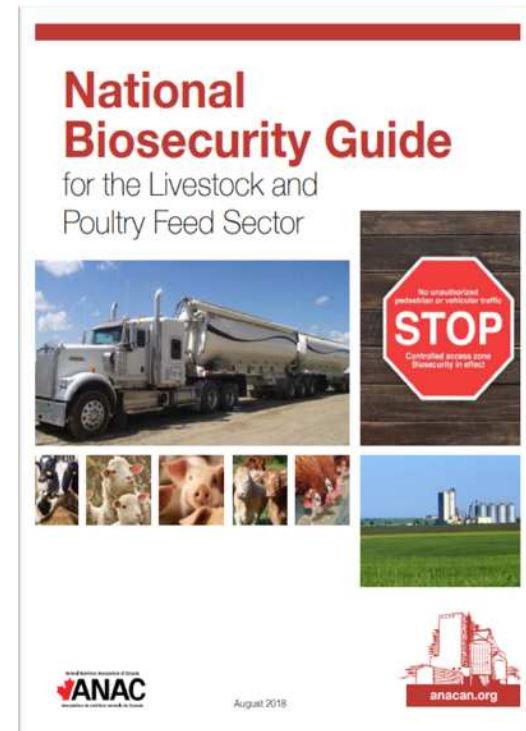
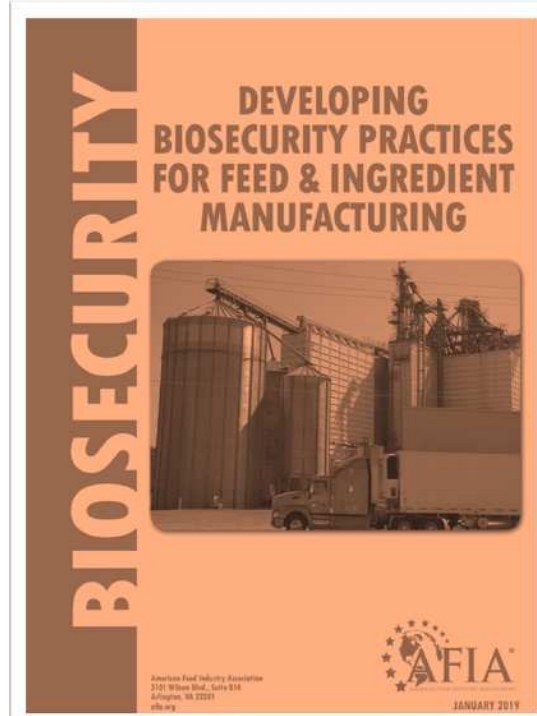
ASFV SURVIVAL		ASFV TRANSMISSION	ASF SURVEILLANCE	COMMUNICATION
IN FEED COMPONENTS	IN FEED COMPUND	THRU INSECTS	METHODS AND PROTOCOLS	METHODS AND EFFECTIVNESS
				
Before, during and after processing of feed from different sources	- During transportation - Storage of compound feed - Possible feed contamination after packaging	Role of different arthropod and flies vectors	There are no sampling protocols for feed testing for ASFV	To raise awareness among all players involved in the epidemiology of the disease to increase compliance with the control measures.

5

BUSINESS AS USUAL DESPITE ASF: BIOSECURITY UPDATES AND HOW THE FEED INDUSTRY HAVE TO ACT

Feed Mill biosecurity is an evolving concept that involves many people within a complex system

CURRENT FEED INDUSTRY BIOSECURITY GUIDES EU, USA, CANADA



Feed Mill Biosecurity is an evolving concept and live document that involves many people within a complex system

SHORT LIST OF FACTORS AND HUMAN ACTIONS INVOLVED IN AFRICAN SWINE FEVER VIRUS SPREAD

FARMERS, HUNTERS



LACK OF INFORMATION

DISPOSAL OF DEAD PIGS



SCAVANGERS'S FOOD

FARMES SELLING PIGS



IN THE FACE OF OUTBREAK

MOVEMENT OF SICK PIGS



TO MARKET OR SLAUGHTER

SWILL FEEDING



"RECYCLING" THE VIRUS

VEHICLE CONTAMINATION



FAST SPREAD OF THE VIRUS

VETS, FARM WORKERS



LACK OF INFORMATION

BIOSECURITY



POOR LEVELS

FLIES



PROPER CARCASE DISPOSAL

TICKS



PERPETUATING HOST

FOMITES



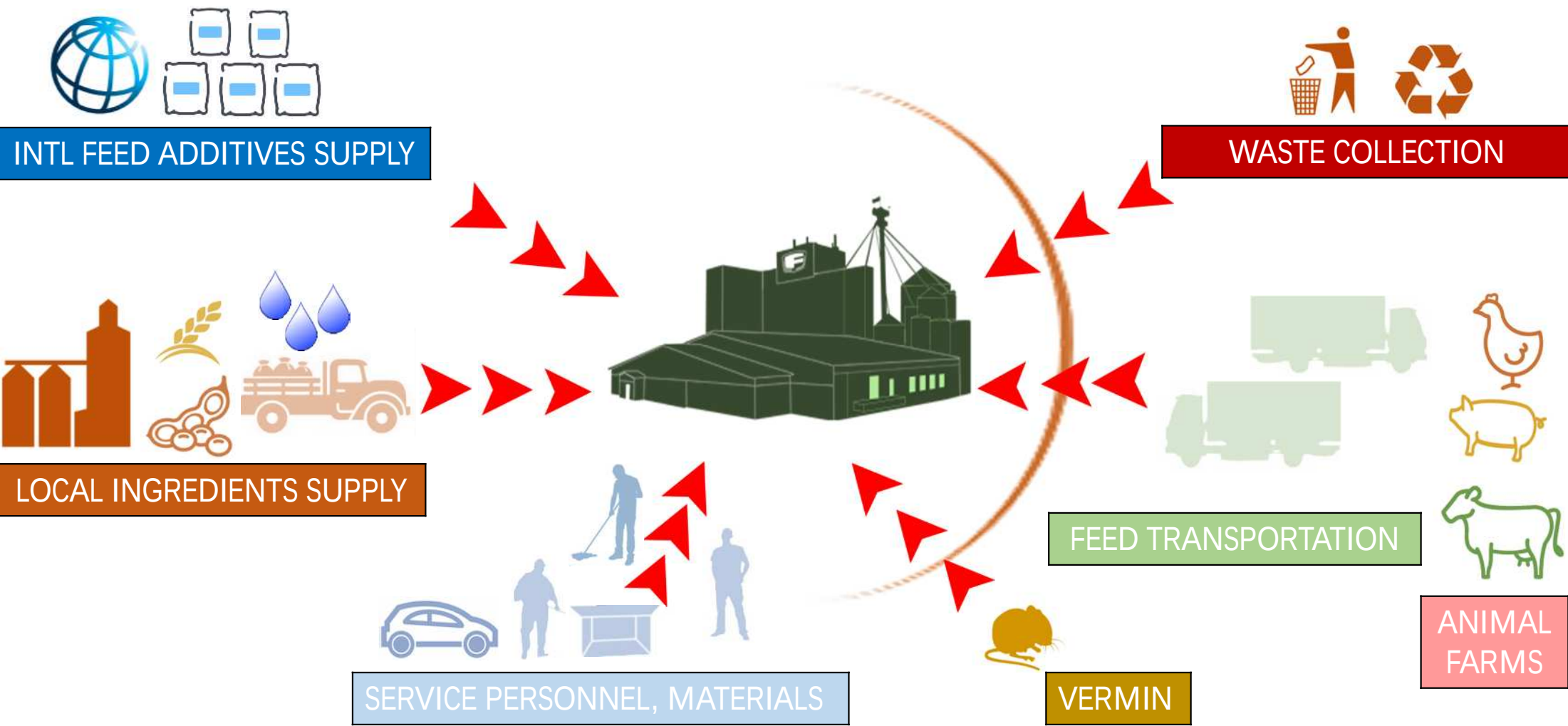
"RECYCLING" FEED SACKS

BORDER SECURITY



LIVE OR PIG PRODUCTS

CHALLENGES IN PATHOGEN CONTROL IN A VERTICALLY INTEGRATED INDUSTRY



Despite stringent biosecurity protocols and a vertically integrated industry, it can still be difficult to control pathogens

FEED MILLS ARE CHALLENGING ENVIRONMENTS TO DECONTAMINATE

Adapted from : KSU, 2017

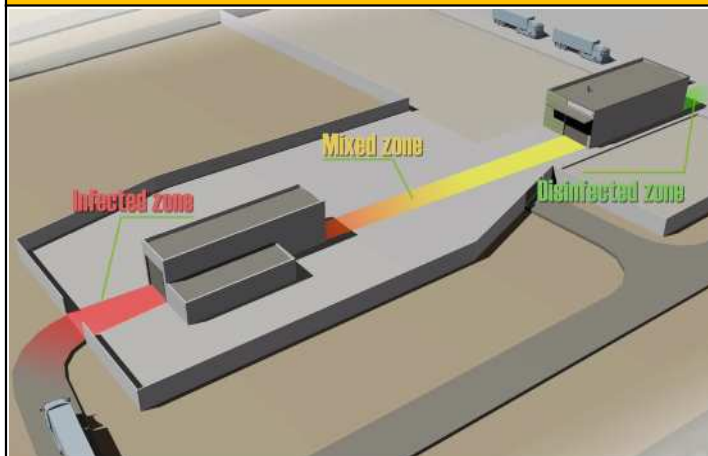
FEED MILLS ARE COMPLEX SYSTEM OF SPECIALIZED EQUIPMENT



Mitigation of hazards in the mill:

- o Dust collection
- o Processing (pelleting temperature)
- o Chemical mitigants

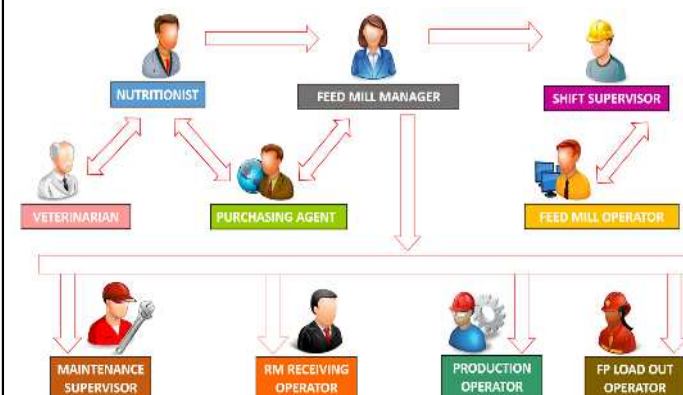
FEED MILLS ARE NOT NECESSARILY DESIGNED WITH BIOSCURITY IN MIND



Prevent cross contamination during load-out and delivery:

- o Dedicated load-out areas
- o Truck sanitation
- o Sequencing loading and delivery

FEED MANUFACTURING: A NETWORK OF MANY PEOPLE



Assessment:

- o Written & detailed biosecurity plan
- o Self and/or 3rd party audits / assessment

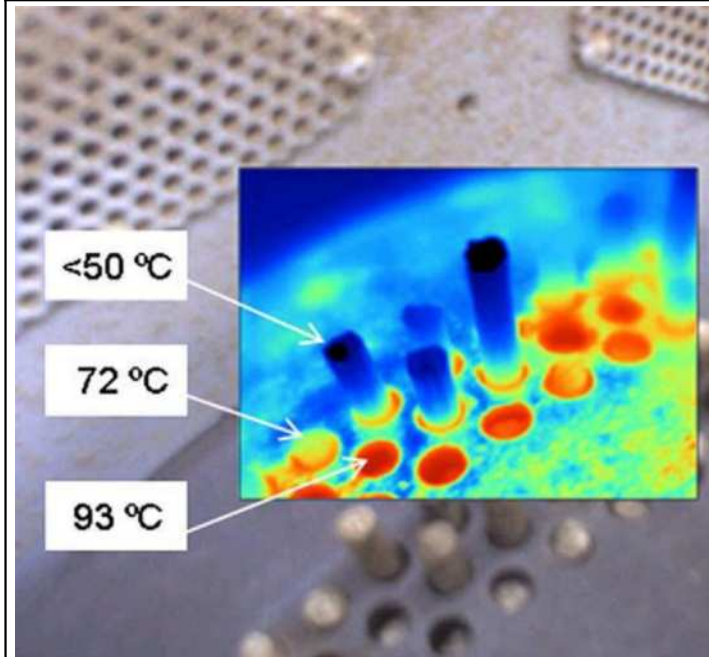
NO. 1 GOAL OF BIOSECURITY PROGRAM IS TO PREVENT CONTAMINATION FROM OCCURRING

INGREDIENTS STORAGE IN CLOSE BINS



Storage duration of feed ingredients in feed mills is usually few days for feed materials and can be 2-3 weeks for premixtures.

PELLETED FEED THERMAL TREATMENT



Pelleted feed, mash feed is conditioned with steam at $T = 60-90$ °C for few sec to up to 2 min.
Mash feed delivered as is it, is not subject to any thermal processing.

FEED TRANSPORT AND STORAGE



Feed = 12% moist (unfavorable ASFv)
Delivered to farms within few hours
Duration of storage: few to 15 days

FEFAC's RECOMMENDATIONS FOR THE DEVELOPMENT OF A BIOSECURITY PLAN IN THE FEED INDUSTRY (I)



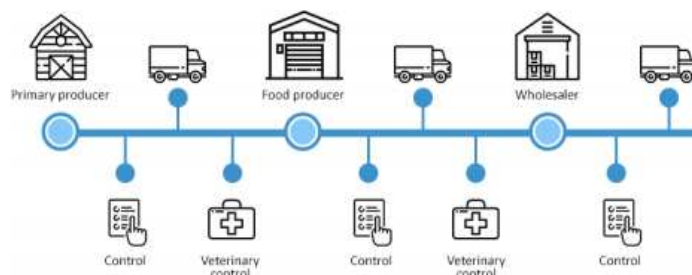
**EACH FEED MANUFACTURER SHOULD DRAFT A BIOSECURITY PLAN,
IMPLEMENT IT AND KEEP IT UPDATED**

Update: June 2019

**BE SCIENCE BASED
AND DRAFTED BY A TEAM**



**COVER FROM FEED INGREDIENTS
INTAKE TO FARM AND VISITORS**



**FORSEE EFFECTIVE TRAINING AND
SUBJECT TO FREQUENT AUDITING**



**BE REVIEWED, MAINTAINED
AND ADAPTED TO NEW PRACTICES**



**INCLUDE MIN REQUIREMENTS
RE INTERACTIONS WITH FARMS**



**CONSIDER ALSO
THE RISK FOR PERSONNEL**

BIOHAZARD



FEFAC's RECOMMENDATIONS FOR THE DEVELOPMENT OF A BIOSECURITY PLAN IN THE FEED INDUSTRY (II)



LEGAL REQUIREMENTS LAID DOWN IN THE EU FEED HYGIENE REGULATION (EC) No 1831/2003 SHALL BE STRICTLY IMPLEMENTED TO PREVENT FEED FROM BEING A CARRIER OF PATHOGENS

Update: June 2019

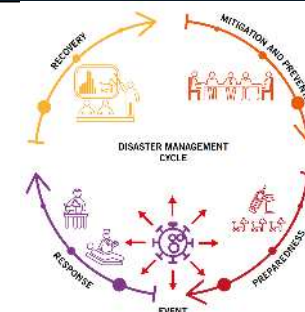
PURCHASE OF INGREDIENTS FROM CLEARLY IDENTIFIED SOURCES



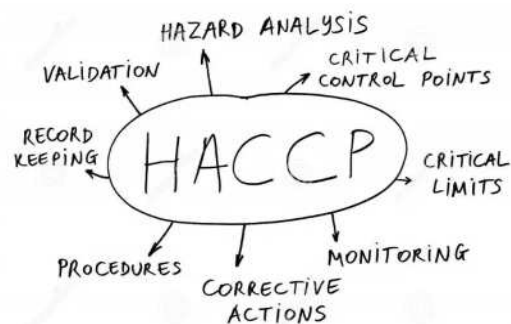
RISK ASSESSMENT IDENTIFYING RISK FACTORS



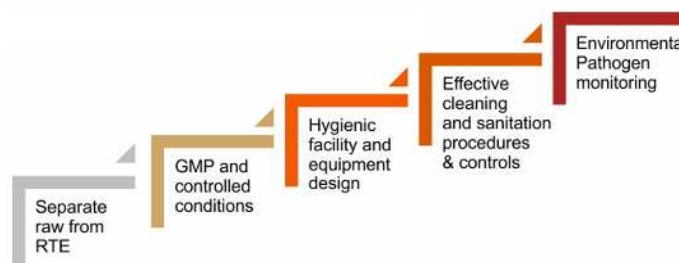
EXISTENCE OF MITIGATION PROCEDURE



OPERATIONAL HACCP PLAN



EFFECTIVE MONITORING PLAN FOR THE PATHOGEN



CONTINGENCY MEASURES IN CASE OF DETECTION



FEFAC's RECOMMENDATIONS FOR THE DEVELOPMENT OF A BIOSECURITY PLAN IN THE FEED INDUSTRY (III)



**MEASURES SHOULD BE IN PLACE TO PREVENT INTRODUCTION OF PATHOGENS
IN THE FEED MILL OTHER THAN VIA FEED INGREDIENTS**

Update: June 2019

KEEP FEED MILL AND SURROUNDING CLEAN



CONTROL PEST AND RODENTS



ESTABLISH HYGIENE REQUIREMENTS FOR STAFF AND VISITORS AND THEIR VEHICLES



STOP
**HAVE YOU
WASHED
YOUR HANDS?**



ESTABLISH HYGIENE REQUIREMENTS FOR DELIVERY TRUCKS



FEFAC's RECOMMENDATIONS FOR THE DEVELOPMENT OF A BIOSECURITY PLAN IN THE FEED INDUSTRY (IV)



TRANSPORT AND DELIVERY OF FEED / FARM VISITS CLEAR RULES

TO CONTROL THE INTRODUCTION OF PATHOGENS IN THE FARM AND DISSEMINATION OF PATHOGENS FROM FARM TO FARM

Update: June 2019

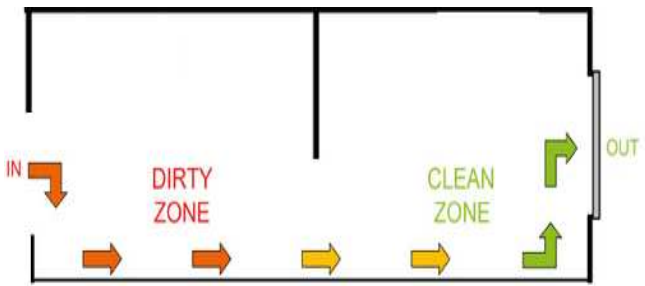
RESTRICT VISITS OF ANIMAL BARN
BY FEED MILL COMPANY EMPLOYEES



COMPLY WITH ON-FARM BIOSECURITY
IN THE FARMS WHERE PLANS EXISTS



AVOID TRUCKS OR DRIVERS
IN THE CLEAN ZONE OF THE FARM



USE UNLOADING EQUIPMENT
AS FAR AS POSSIBLE



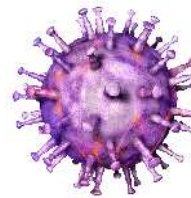
ESTABLISH CLEAR RULES FOR THE USE
CLEANING, DISINFECTION, VEHICLES



KEEP DETAILED DIARY
DELIVERIES TO EACH INDIVIDUAL FARM



IS THE INGREDIENT
MANUFACTURED OR PACKED IN A COUNTRY
WITH ACTIVE VIRAL TRANSMISSION?



pork
checkoff

DECISION
TREE MATRIX
TO MINIMIZE VIRAL
TRANSMISSION
RISK FROM
FEED INGREDIENT

Adapted from: Pork.org, 2018



NO:
LOW RISK

YES:

IS THE INGREDIENT
CONSIDERED AT RISK FOR
TRANSPORTING VIRUS?



NO:
MINOR RISK

YES:

IS THE INGREDIENT SUBJECTED TO
MITIGATION PROCEDURES TO
REDUCE ITS RISK?



Current research is looking at hazard analysis, risk-based preventive controls, block chain strategies, biosecurity measures for feed mills and pathogen survival times in feed and ingredients.

*** Considerations to further reduce risk: Consider excluding, sourcing from a country without active viral transmission, or mitigating ± risk prior to receiving (if bulk) or un packaging (if tote or bagged).*

YES:
MODERATE RISK**



NO:
HEIGHTENED RISK**



6

KEY TAKE AWAY MESSAGES

ASF is here to stay for the next decades.
Hope for the Best; Prepare for the Worst

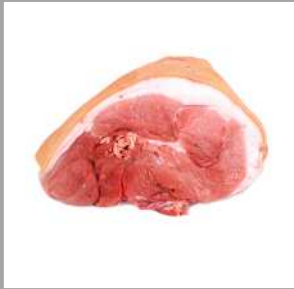
U.S. SOY for a growing world

Get bigger and cleaner, or get out



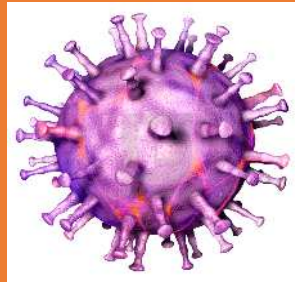
Source: Reuters, 2018

TAKE AWAY MESSAGES



PORK IS A
MAJOR SOURCE
OF FOOD

ASF HAS THE
POTENTIAL TO
DRAMATICALLY
DISRUPT AND CHANGE
THE GLOBAL PROTEIN
PRODUCTION,
CONSUMPTION AND
MEAT TRADE FLOWS



ASF
IS A VERY
PATIENT VIRUS

ASFV REMAINS
VIALE FOR LONG
PERIODS AND CAN
MULTIPLY IN VECTORS

ASF IS A “NOTIFIABLE
DISEASE”



HUMAN
INATTENTION IS
DRIVING
THIS EPIDEMIC

OUR VAST NETWORKS OF
FOOD PRODUCTION ,
DISTRIBUTION,
CONSUMPTION AND
WASTE DISPOSAL, ARE
MAKING AN ALREADY
GRAVE SITUATION WORSE



UPDATE YOUR
FEED MILL
BIOSECURITY

FEED MILL BIOSECURITY IS
AN EVOLVING CONCEPT
THAT INVOLVES MANY
PEOPLE WITHIN A
COMPLEX SYSTEM

THERE ARE BIG RETURNS
ON DOING THINGS RIGHT
WHEN IT COMES TO
BIOSECURITY



THANK YOU FOR YOUR ATTENTION !
ご清聴ありがとうございました

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