



PORCINE EPIDEMIC DIARRHEA : **A Canadian perspective**

Julie Ménard, Agr., D.V.M.

F. Ménard inc., Québec, Canada


SIPAS MEETING

Parma, Italy

October 9, 2015



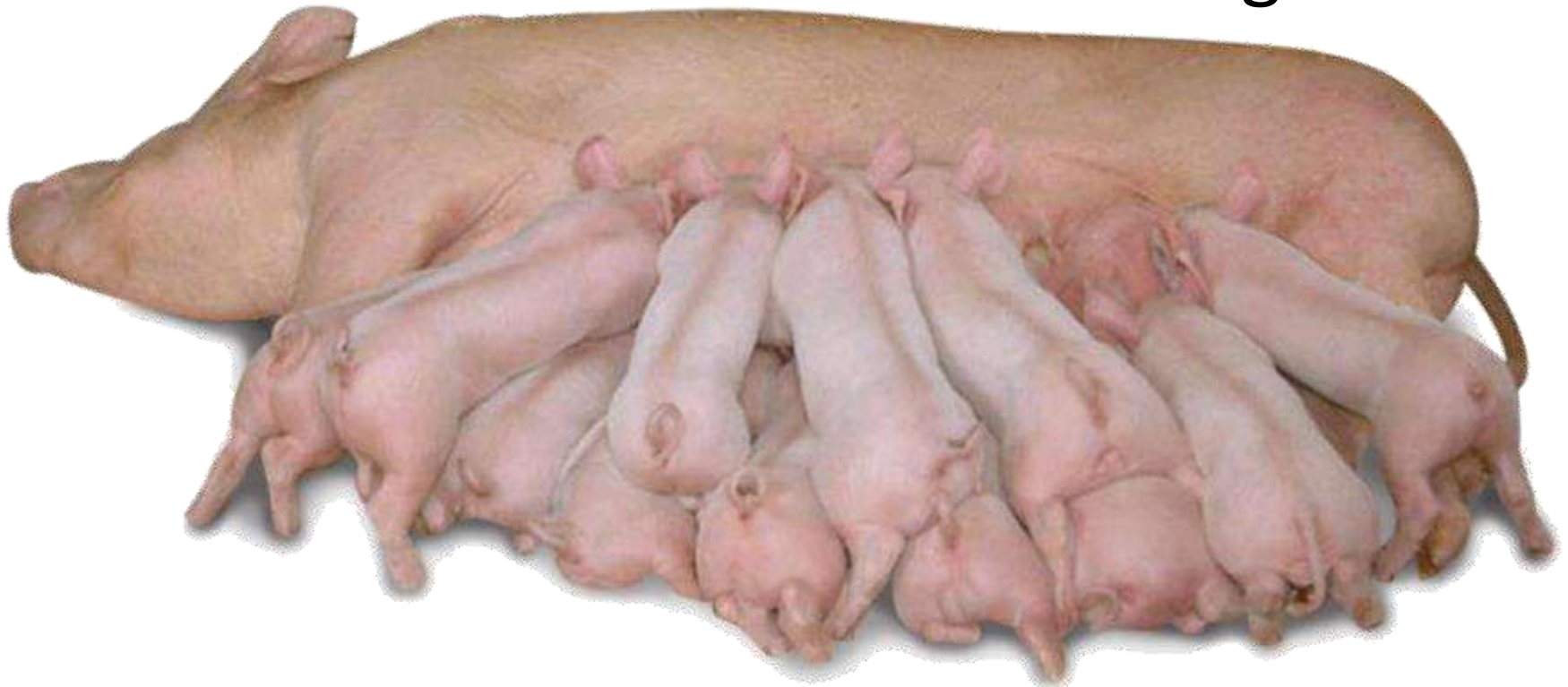
My personal background

- 
- **Swine practitioner in Canada**
 - **28 years with F. Ménard**
 - **Integrated system**
 - **Marketing 1,1 million pigs/year**

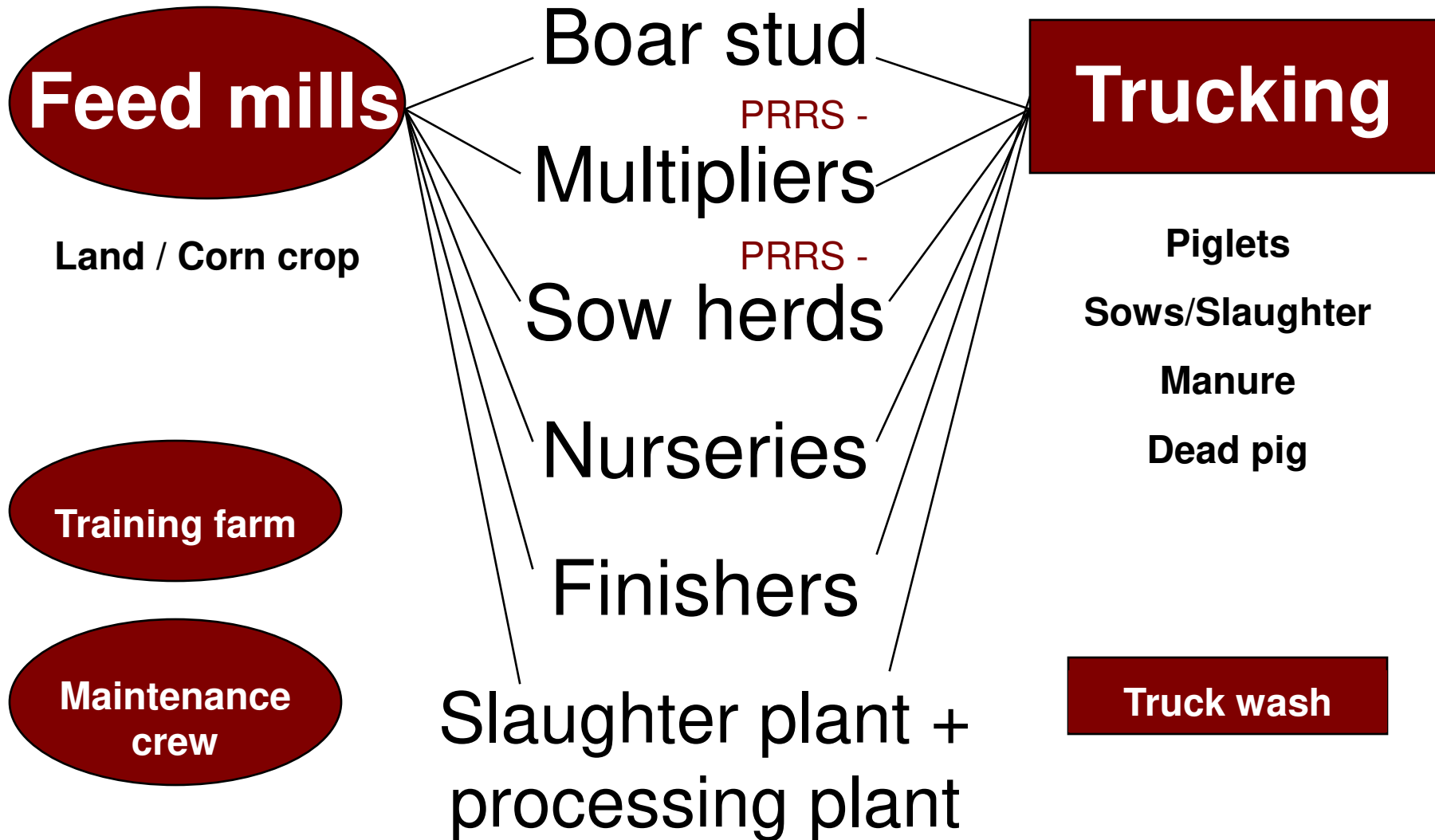
My expertise

Breeding herd

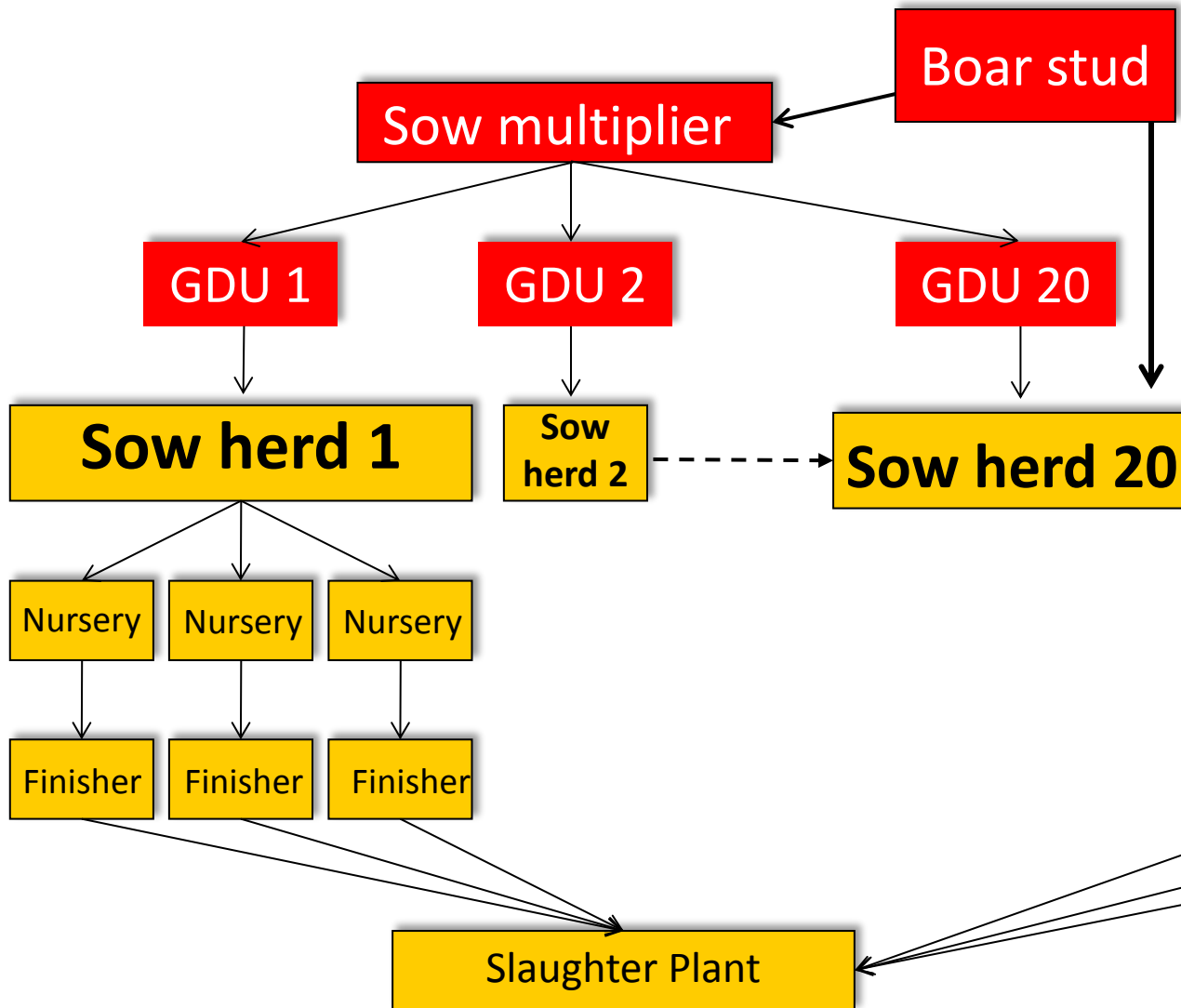
- Health
- Production
- Management



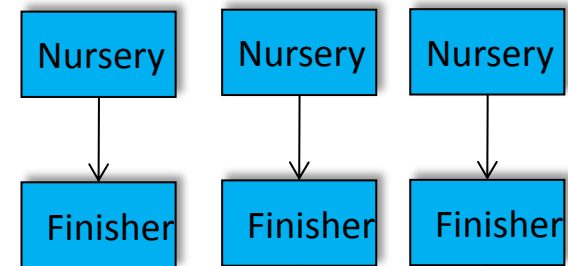
F. Ménard production system



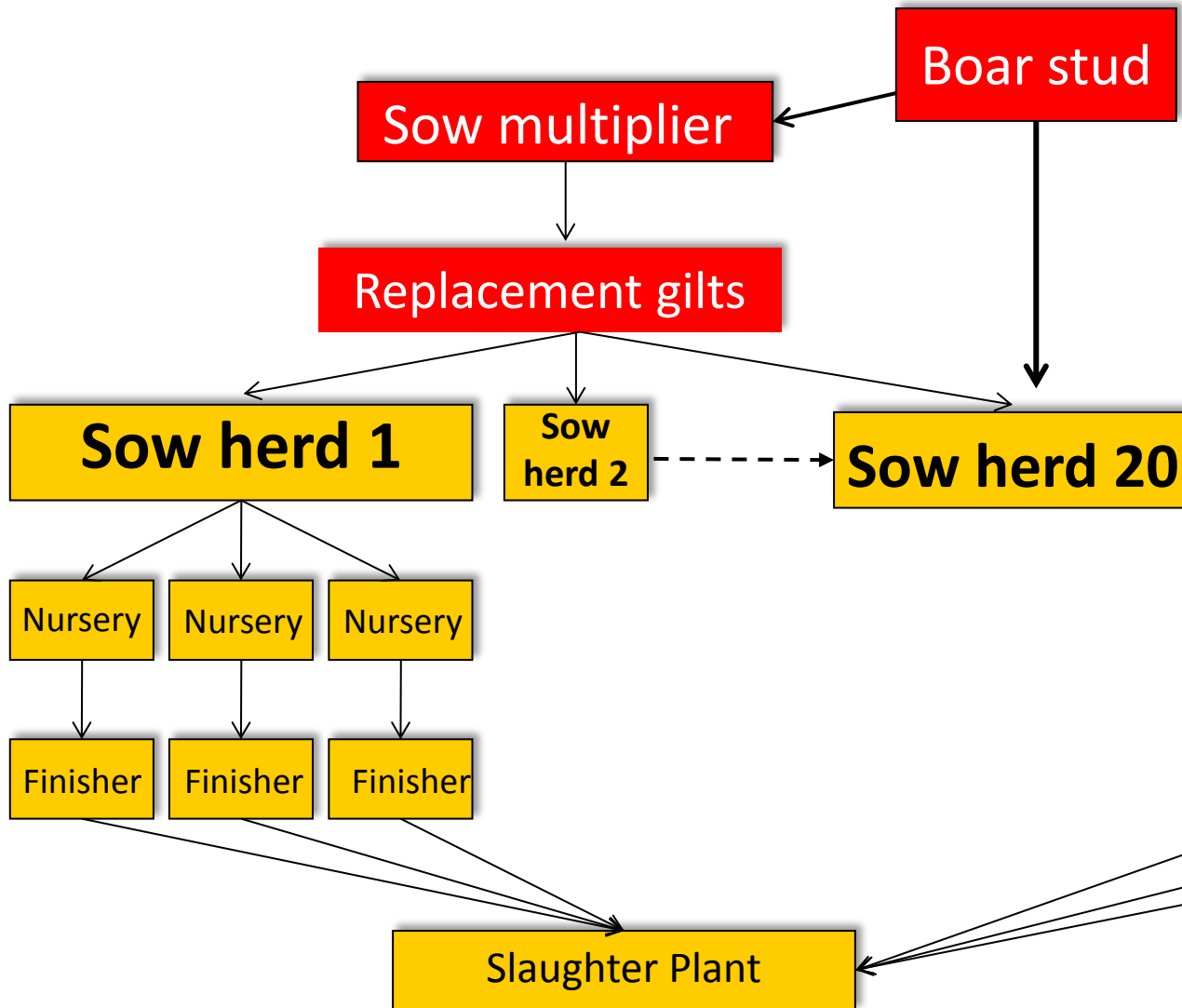
F. Ménard production system



- ❖ 20 flows
- ❖ Single source
- ❖ Multisite
- ❖ AI/AO by barn or site
- ❖ Individual GDU

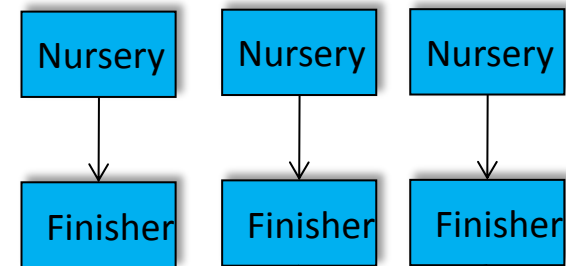


F. Ménard production system - Impact of PEDv



PEDv

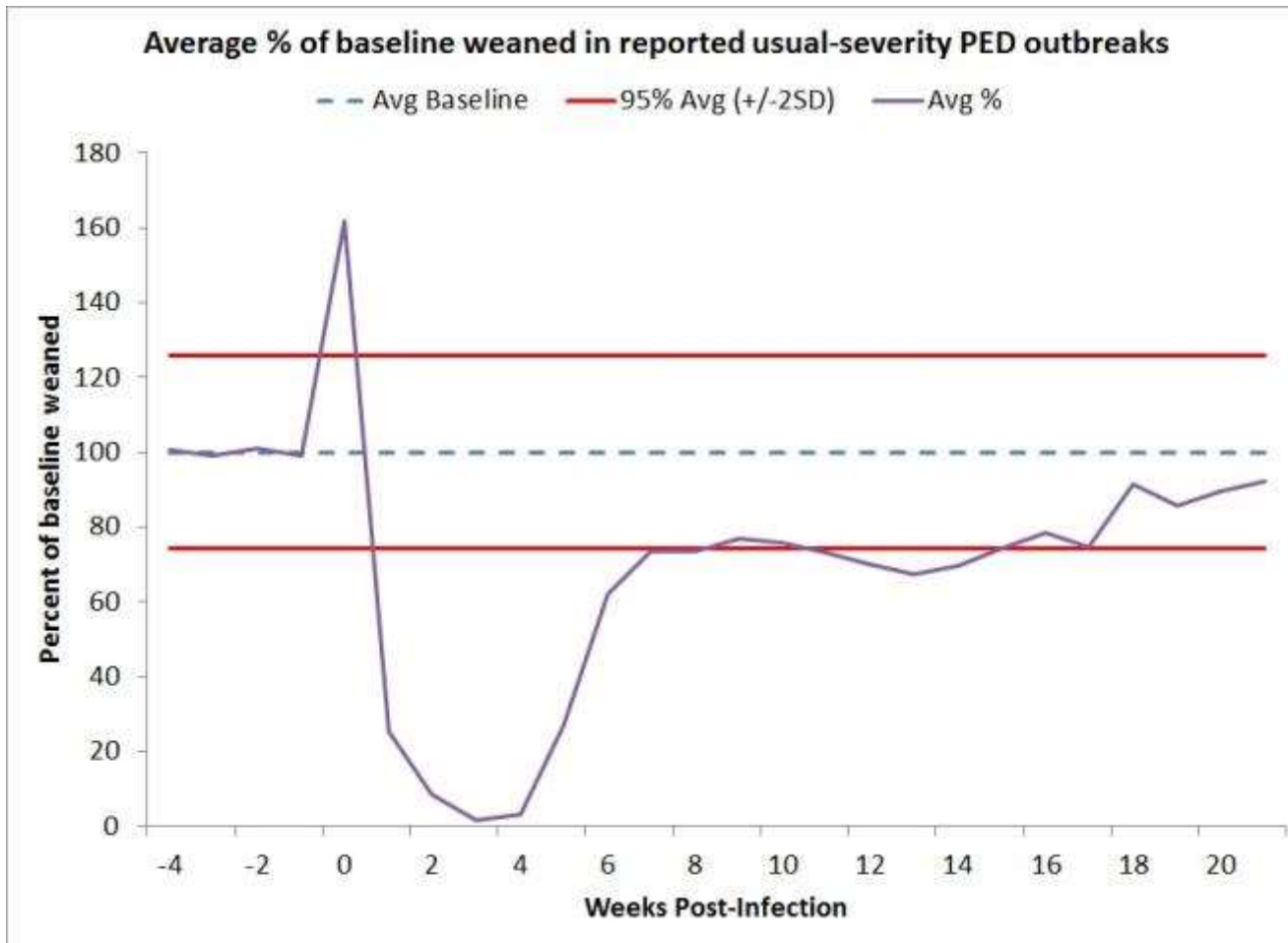
- ❖ Highly contagious
- ❖ Highly resistant in the environment
- ❖ High level of shedding



DOMINO EFFECT

Production impact of PEDv

“Classic” PED



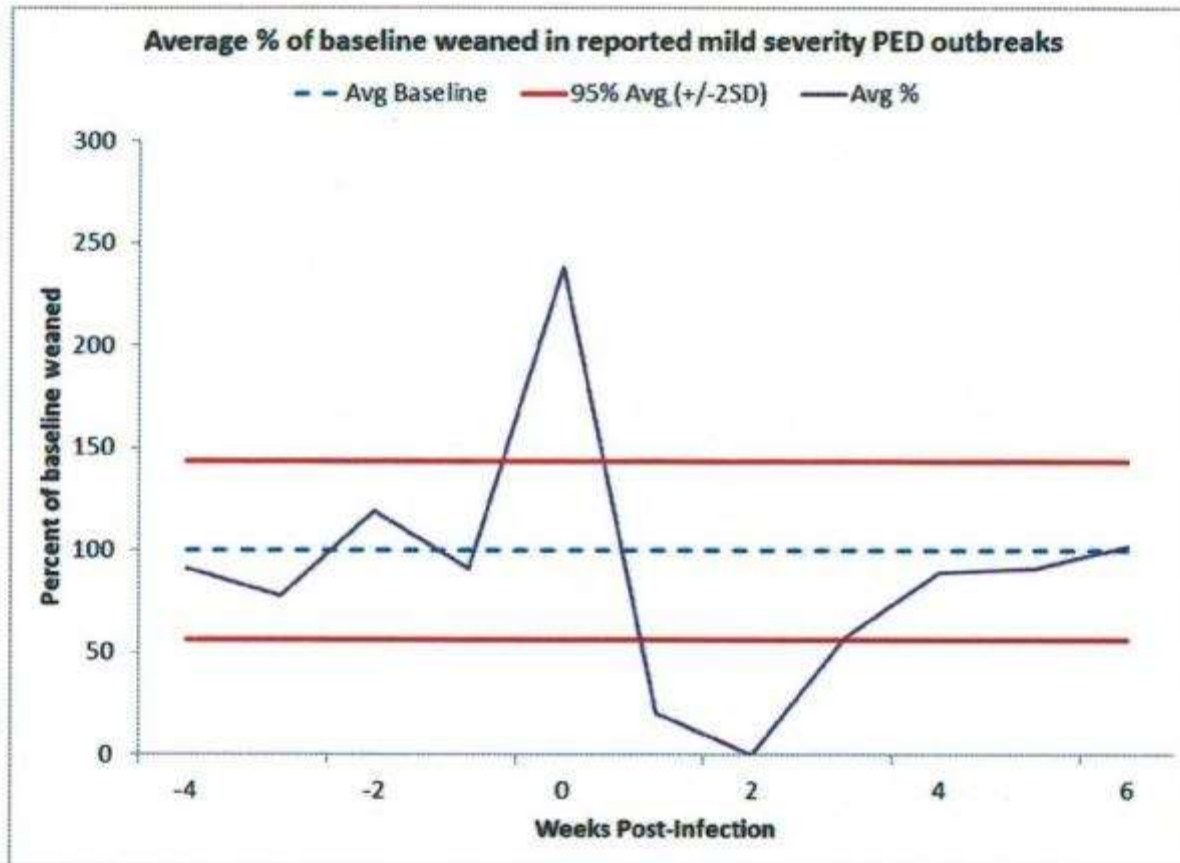
- n = 86 herds
- Avg TTBP = 7.4 wks
- 95% CI = 1.7-13
- Avg lost
2,501/1000 sows
- 95% CI = 64-4,939

D. Goede, B. Morrison

Swine Health Monitoring Project, 2014

Production impact of PEDv

“Indel strain”



- n = 3 herds
- Avg TTBP = 3 wks
- Avg lost 938/1000 sows

PED: update on the present status within Europe

Andrea Ladinig

10-Jul-2015 (4 days ago)

In contrast to individual areas within Europe like Northern Italy, most European countries did not observe clinical disease due to infection with porcine epidemic diarrhea virus over the last decades and therefore, the presence of the virus was not intensely investigated.





Clinical Signs of Porcine Epidemic Diarrhoea in Ukraine in 2014

Friday, February 06, 2015

<http://www.thepigsite.com/articles/4950/clinical-signs-of-porcine-epidemic-diarrhoea-in-ukraine-in-2014>

Dr John Carr, pig veterinarian, describes the clinical signs of Porcine Epidemic Diarrhoea (PED) in Ukraine in 2014 associated with a Chinese/US PED virus. Around 30,000 piglets were lost in the outbreak and performance took almost five months to return to normal.

CASE REPORT

Open Access

Emergence of porcine epidemic diarrhea virus in southern Germany



Julia Stadler^{1*}, Susanne Zoels¹, Robert Fux², Dennis Hanke³, Anne Pohlmann³, Sandra Blome³, Herbert Weissenböck⁴, Christiane Weissenbacher-Lang⁴, Mathias Ritzmann¹ and Andrea Ladinig⁵

Expéditeur: André Broes <andre.broes@biovet-inc.com>

Date: 27 janvier 2015 09:04:25 HNE

Destinataire: André Broes <andre.broes@biovet-inc.com>

Objet: TR: 9eme cas de PEDV aux Pays-Bas

Weer nieuw geval van PED

Geplaatst op dinsdag 27-01-2015

De afgelopen dagen heeft er zich weer een nieuw geval van PED voorgedaan op een vleesvarkensbedrijf. Het PED virus is nu op 9 varkensbedrijven in Nederland vastgesteld sinds het eerste geval in november 2014.

DIARREA EPIDEMICA DEL SUINO (PED): AGGIORNAMENTO DELLA SITUAZIONE IN ITALIA

A cura del Dr. Loris Alborali - Istituto Zooprofilattico Sperimentale Lombardia Emilia Romagna "Bruno Ubertini"

Situazione in Italia

In Italia la Diarrea Epidemica Suina (*Porcine Epidemic Diarrhoea* - PED) è presente sin dai primi anni '90. La sua diffusione è andata aumentando con il contemporaneo declino dei casi di Gastroenterite Trasmissibile (TGE), l'altra enterite da Coronavirus del suino, largamente diffusa negli anni '70 e '80. La prima seria ondata epidemica di PED si è registrata all'inizio degli anni '90. Di fatto, dopo la sua comparsa, la PED ha avuto nel nostro Paese un andamento ciclico con picchi epidemici l'ultimo dei quali risale al periodo 2005-2006. In particolare nel periodo 1994-2000, l'esame al ME ha permesso di evidenziare particelle virali riferibili a PEDV in un totale di 296 (14.2%) su 2072 campioni esaminati.

Proprio in concomitanza con l'ultima epidemia di PED del 2007 -2008 al fine di affinare le metodiche diagnostiche e ottenere risultati affidabili, presso l'IZSLER si sono sviluppati metodi diagnostici di screening e di conferma (ELISA, RT_PCR) .

Nella seconda metà di gennaio 2015 sono stati diagnosticati 4 focolai di PED in Lombardia (2 in provincia di Brescia e 2 in Provincia di Mantova) che clinicamente e dal punto di vista dei danni si stanno comportando come gli ultimi focolai visti in Italia. Il ceppo responsabile è PEDV-USA ma è considerato meno aggressivo e grave rispetto a quello ad elevata virulenza che in America ha causato i gravi danni descritti.

Sorveglianza attiva negli allevamenti – diagnosi rapida

Il sospetto di PED si deve avanzare quando compare improvvisamente una forma enterica caratterizzata da diarrea liquida e profusa e diffusione rapida tra suini dello stesso settore e tra capannoni contigui. Normalmente la morbilità è molto elevata (80-100%) mentre la mortalità è molto bassa o assente nei riproduttori e nei grassi ed elevata nei suinetti sottoscrofa ed in svezzamento. Un episodio sospetto si può considerare accertato quando si ha un riscontro di laboratorio con evidenziazione di positività per coronavirus mediante RT PCR e/o ELISA. Di seguito verrà effettuata la tipizzazione del ceppo al fine di monitorare l'eventuale circolazione di nuovi ceppi. I campioni possono essere conferiti alle Sezioni Diagnostiche IZSLER.

Biosicurezza in allevamento e dei trasporti

In allevamento devono essere intensificate le misure di biosicurezza esterna ed interna previste nel protocollo della "Biosicurezza degli allevamenti suini" tenendo in particolare considerazione i parametri che riguardano la trasmissione via fecale degli agenti patogeni. Per quanto riguarda i mezzi di trasporto dovranno essere preferiti i carichi di animali (morti , scarti e venduti) all'esterno dell'azienda e comunque dovranno essere eseguite e verificate le tecniche di pulizia e disinfezione dei mezzi e la presenza di aree dedicate alla pulizia e disinfezione dei veicoli.



Italy: the confirmed PED outbreaks are due to a low-pathogenicity strain

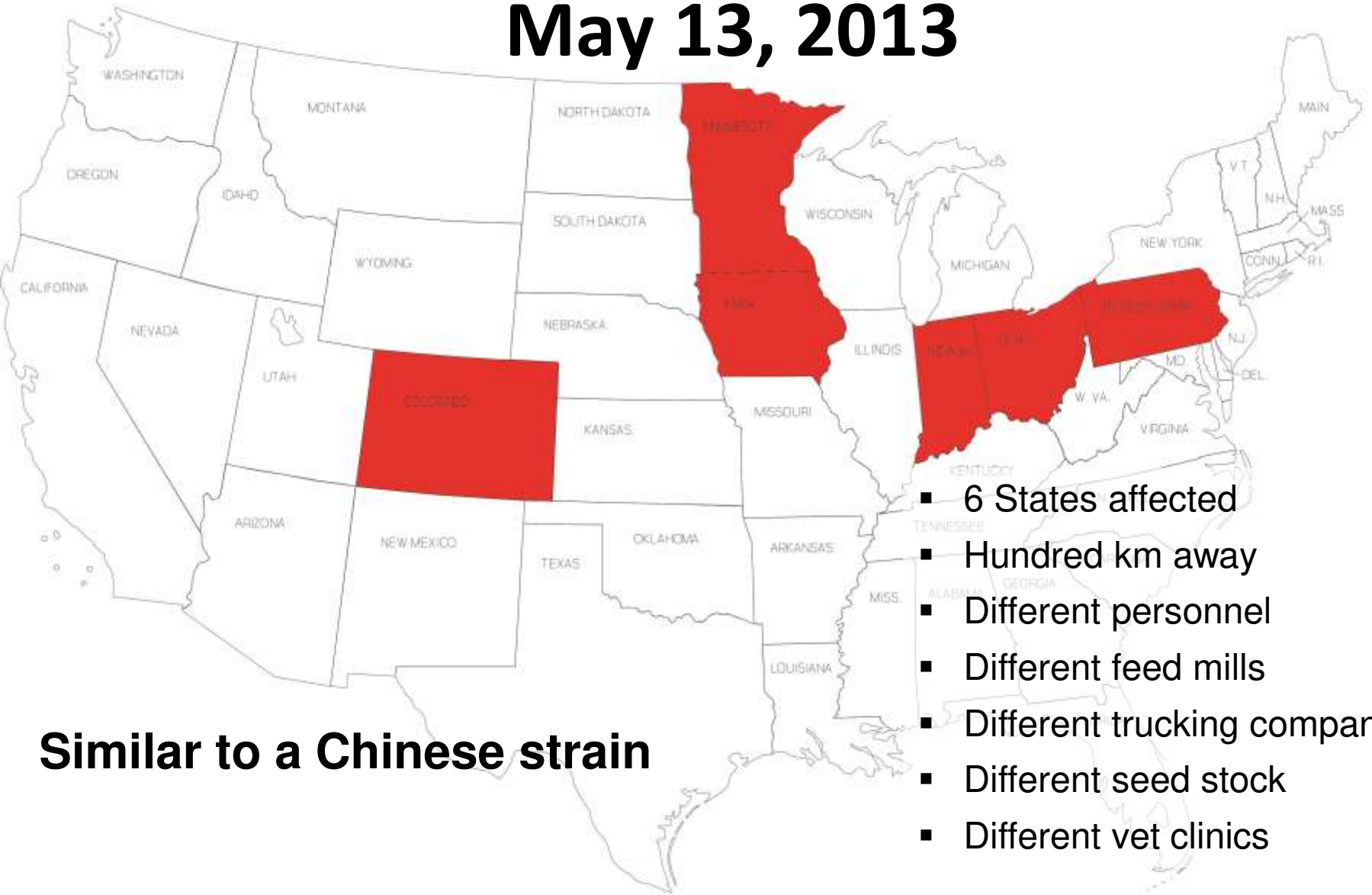
03-Feb-2015 (3 days ago)

Thursday, 29 January 2015/ANAS/ Italy.
<http://www.anas.it>

Last 29 January, the Italian National Pig Producers' Association (ANAS) published in its webpage the importance of the measures to prevent the spreading of the PEDv after the alarm due to the detection of four outbreaks of this disease in Lombardy.

United States : Emergence of PED

May 13, 2013



- 6 States affected
- Hundred km away
- Different personnel
- Different feed mills
- Different trucking companies
- Different seed stock
- Different vet clinics

Similar to a Chinese strain

Porcine epidemic diarrhoea



0 hr



12 hrs



24 hrs



48 hrs

TGE on steroids!

Economic impact of PEDv

“Classic strain”

❖ Breeding herd – 1500 sows

- Net loss of 3800 piglets
- 150 000 \$ (Can)

Real impact :

- Pig flow
- Whole chain contamination



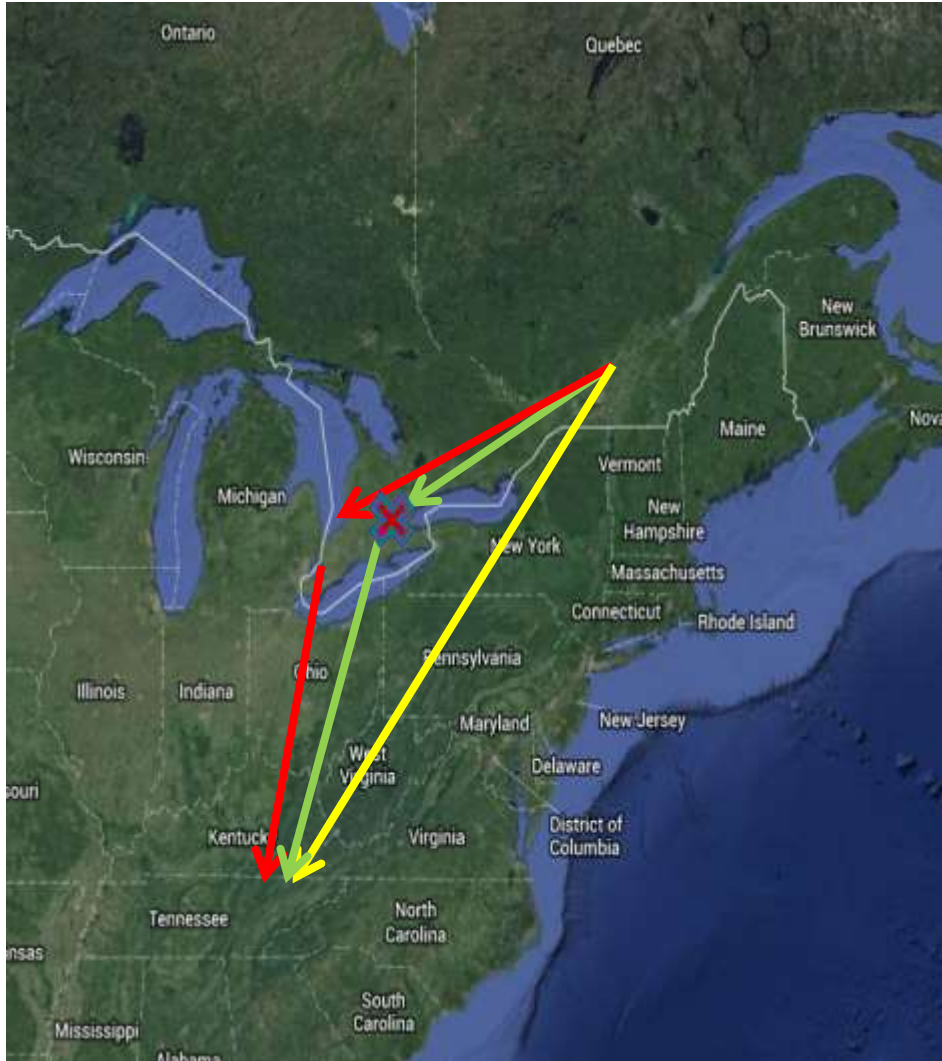
My goal

***« Prevent introduction of PED
in our breeding herds by a
strict follow up of biosecurity
measures »***


Here to share some of my experience...

Fall – Winter 2013

Risk of PED introduction in Canada



**High traffic
between US and
Canada for
weaned piglets
and culled sows**



January 21, 2014

First PED cases in Canada

- Ontario = Farrow to finish farm
- Quebec = An abattoir loading dock
(not F. Ménard)

The danger was real !



January – February 2014

Province of Ontario

Rapid transmission

- 11 farms contaminated within 20 days
- Tracing back :
 - 10/11 cases associated with starter feed
 - US porcine plasma
 - PCR positive by testing
 - Confirmed by CFIA – Swine bioassay

Epidemiology – The ultimate proof



- Prince Edward Island →
12 pig farms
- No connection with
Ontario except same feed





**Risk assessment of feed ingredients of
porcine origin as vehicles for
transmission of Porcine Epidemic
Diarrhea Virus (PEDV)**

Sampedro, F¹., Snider, T²., Bueno, I²., Bergeron, J¹., Urriola, P³., Davies, P^{2*}.

RESEARCH ARTICLE

Open Access

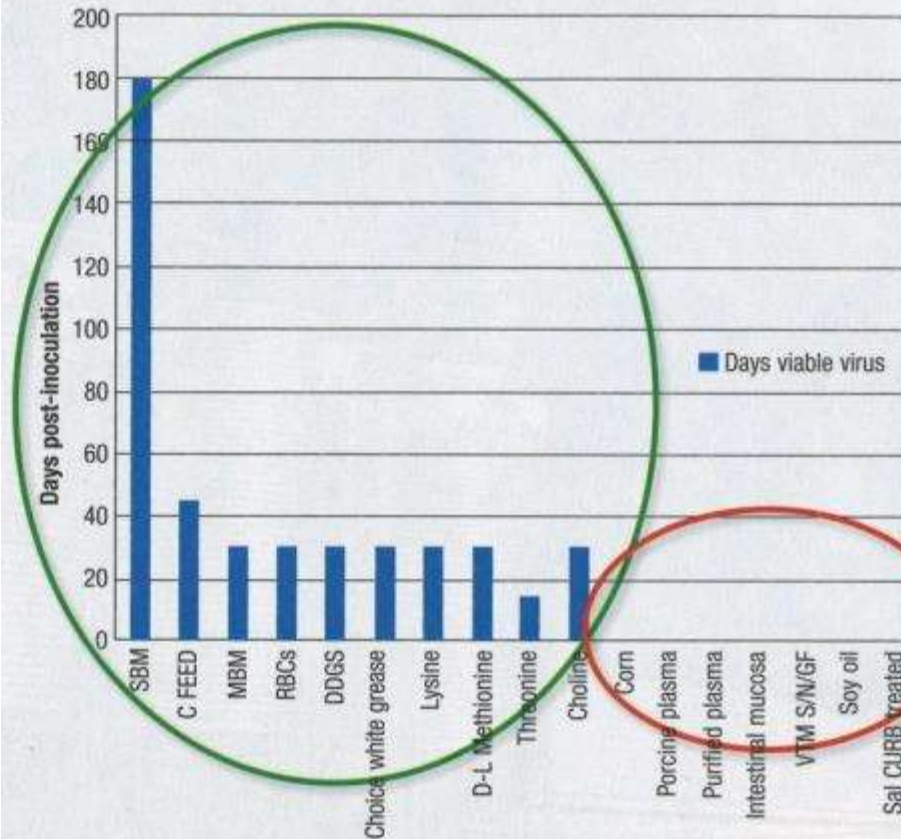
An evaluation of contaminated complete feed as a vehicle for porcine epidemic diarrhea virus infection of naïve pigs following consumption via natural feeding behavior: proof of concept

Scott Dee^{1*}, Travis Clement², Adam Schelkopf¹, Joel Nerem¹, David Knudsen², Jane Christopher-Hennings² and Eric Nelson²

PEDV viability in feed ingredients researched

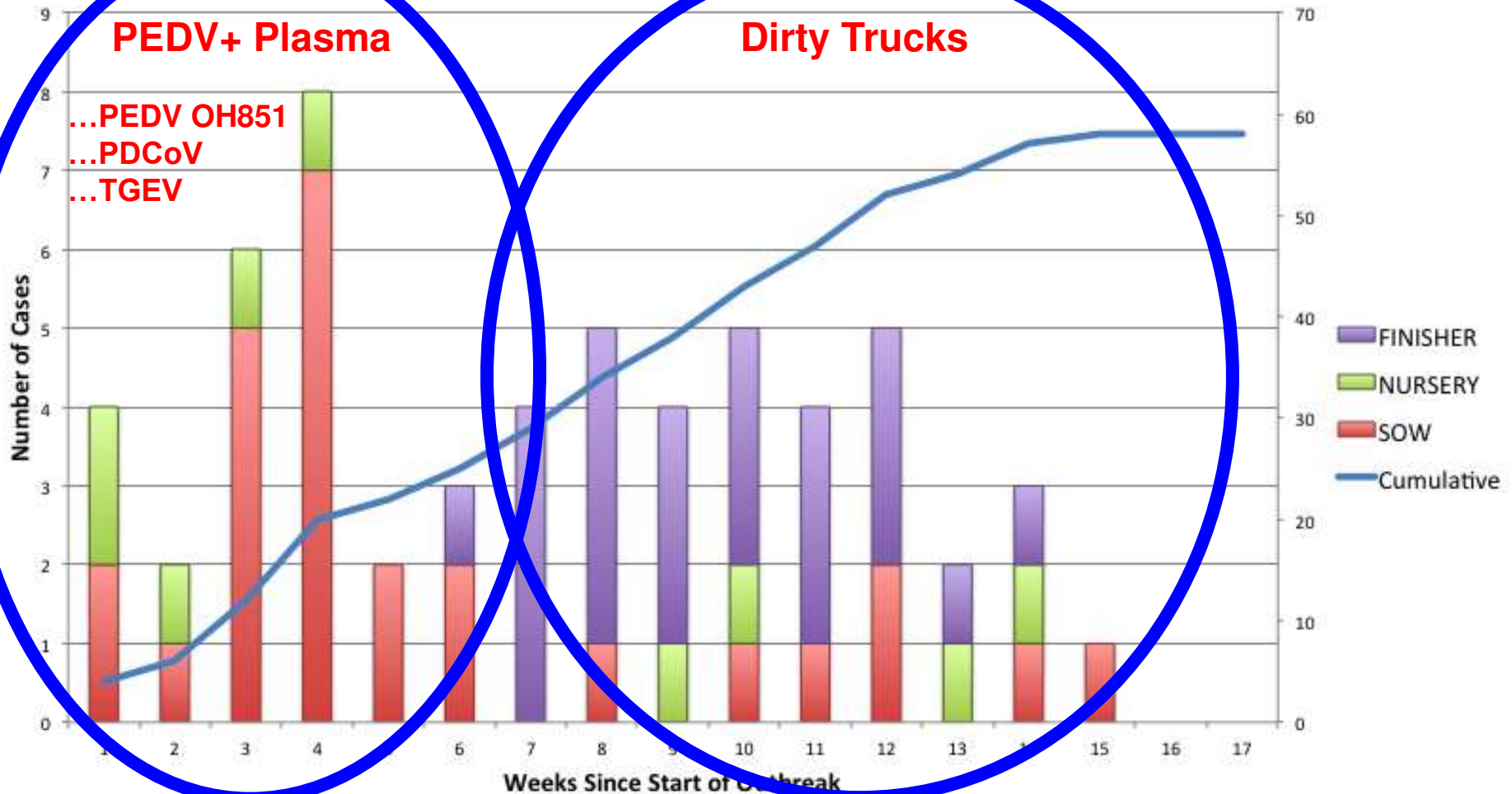
By Kevin Schulz

Days viable PEDV detected post-inoculation of feed ingredients



Canada – Ontario 2014

PED Cases per Week by Farm Type in Ontario
Since Jan. 22, 2014

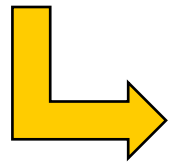




February 12, 2014

First case = F. Ménard

Our abattoir loading dock = PCR positive sample

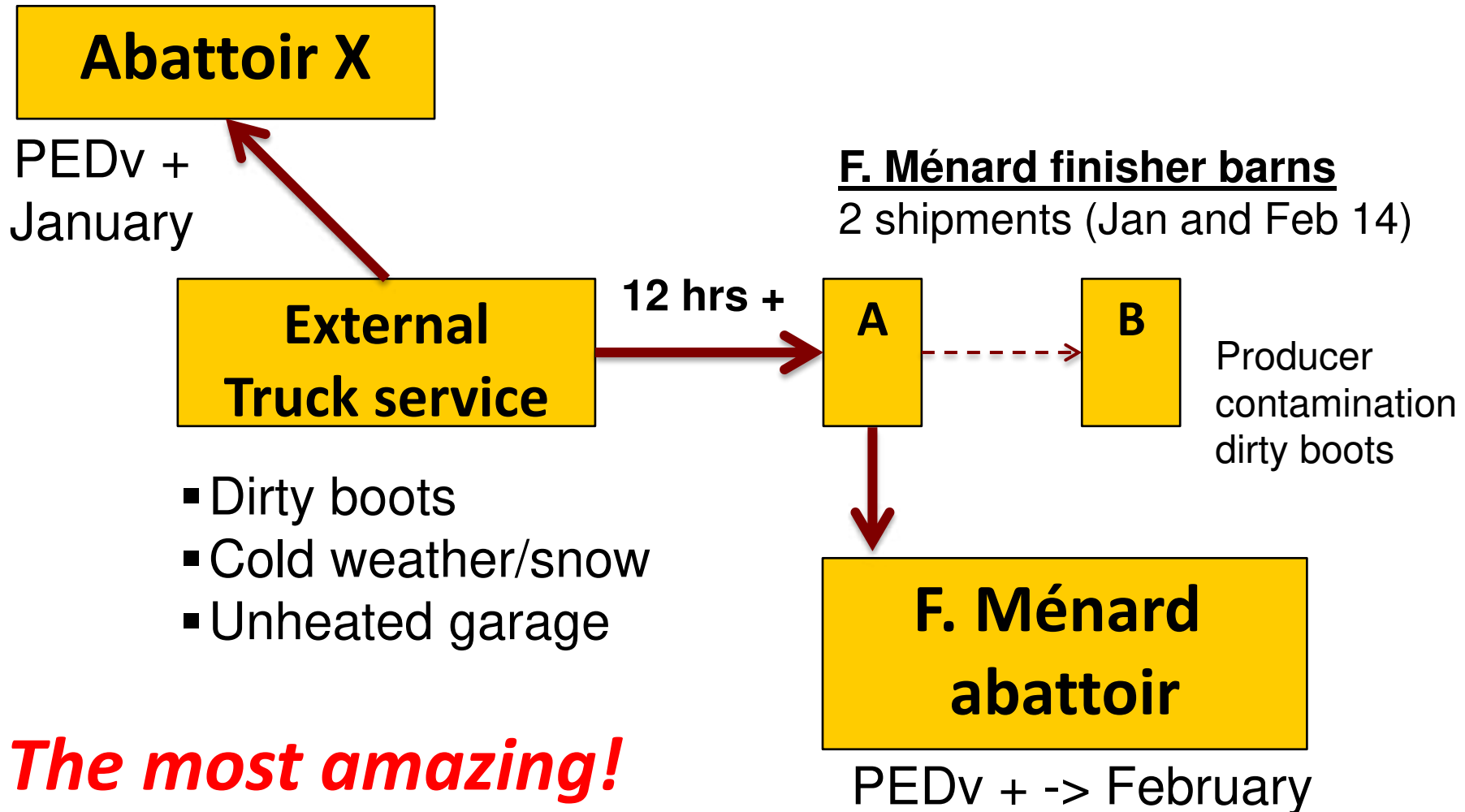


Tracing back = 17 producers

All farms sampled

One culprit !

Story of contamination



The most amazing!
No clinical signs



A nice ending to the story

1. Good biosecurity can prevent PEDv transmission

- *Our supervisor visited 50 clients in addition of this client and did not transmit PED*

2. Good sanitation can get rid of the virus

- *PEDv was eradicated from the 2 barns, trailers and truck wash*



What did we improved at F. Ménard?

- Feed
- Transports
- Farms biosecurity
- Preventive diagnostics

Prevention of PED - Feed

As of February 2014



**Stop completely
the use of
porcine based
protein in our 2
feed mills**

Prevention of PED - Transport



- **Dedicated trucks**
- **90% controlled by F. Menard**
- **Reinforce biosecurity rules**

Prevention of PED - Transport



➤ Drivers education



➤ Written SOP's

Prevention of PED - Transport

Dedicated heated garage

**Multiplication
and gilts delivery
trucks**

Garage A

**Weaned piglets
trucks**

Garage B

**Grow-finish pigs
trucks**

Garage C

Washed by the drivers

Specialized crew

Split the risks

Prevention of PED- At the sow farm level



Shipment of weaned piglets and culled sows

- Dedicated section in the barn
- No trucker admitted
- Always washed and disinfected following transport with specific material

Producers - Visitors

Breeding herds



SHOWER IN

Nursery – finish farms



BENCH ENTRY

Prevention of PED -Service people

Rules for vehicle



Prevention of PED – Service people

- Rules at the office/feed mill/truck wash/gas station



Prevention of PED – Service people



- **2 different crews :
sow farm and grow-
finish**
- **Different trucks**
- **Sow farms highly
equipped**

Prevention of PED - Sow farms

Strict rules for material entry



Disinfection room

- 24 hrs
- Heated
- Dry



PEDv prevention – Education !!!

Information meetings

- ❖ Producers and farm supervisors
- ❖ Tech service
- ❖ Service providers
 - ❖ Electrician
 - ❖ Equipment company
 - ❖ Maintenance crew
 - ❖ Rodents control
 - ❖ Manure handling crew
- ❖ Truck drivers



PEdV prevention – F. Ménard

Intensive diagnostic testing

- ❖ Early detection
- ❖ Quick intervention

Crucial for PED control



PED sampling at high risk spots

- Abattoir loading dock
- Nursery post-arrival
- Grow-finish before slaughtering
- Truck wash station
- All trucks
- Replacement gilts pre and post delivery



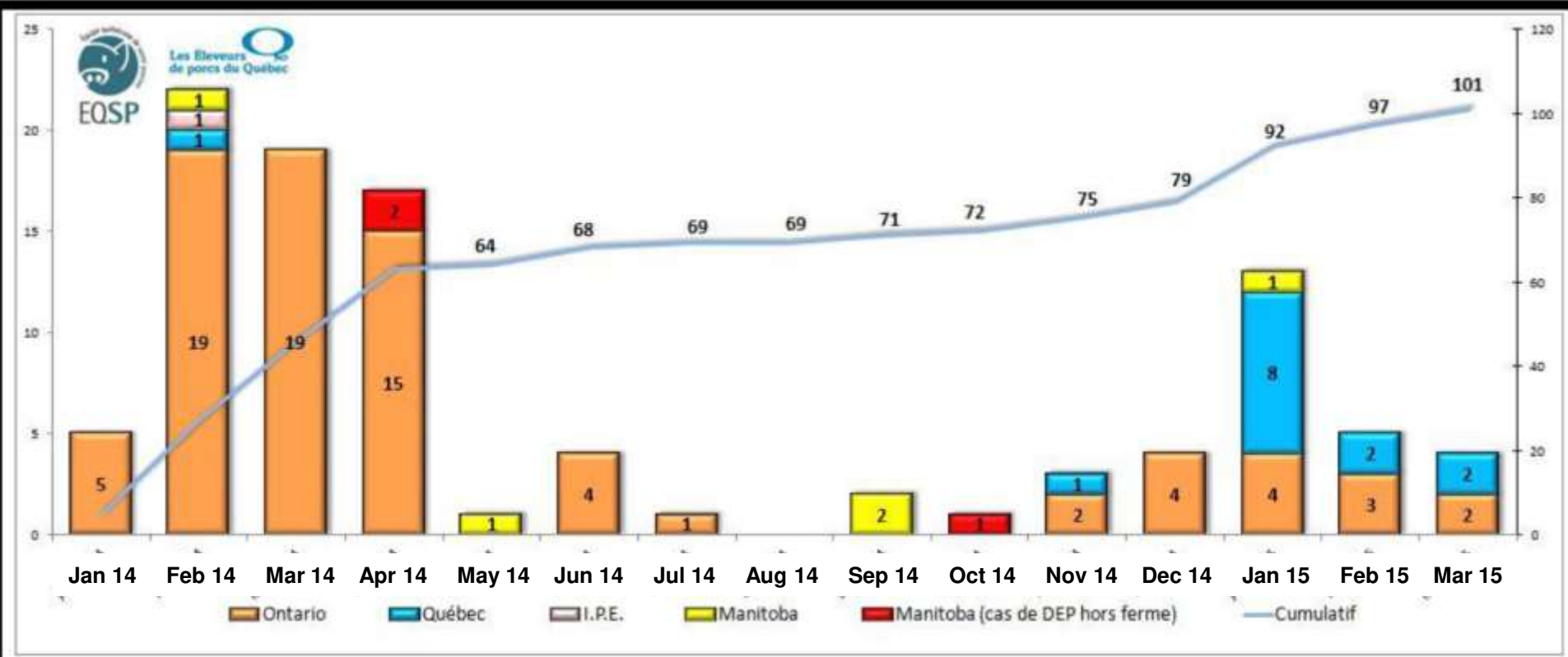
Diagnostic test used

PCR

- Feces : nursery and finisher pigs
- Oral fluid : gilts
- Swabbing (“Swiffer”) :
 - Trucks
 - Abattoir loading dock
 - Truck wash station

PED was quiet in summertime

PED in Canada 2014-2015






PEDv loves winter !



End of 2014

■ Large nursery-finisher site

- 3 days post piglet delivery
- Intensive scour
- Sampling 8 days later
- The result : **December 31 = PCR positive**
- **12 barns on the site**
- **Same producer**



January 2015 - 20 days later...

- 3 sites infected
- 13 barns
 - Nursery and finishers
- 20 000 pigs total

A big mess...



The culprits of this rapid transmission

■ First, the transport

➤ *Not F. Ménard trucking system*

■ Then, the producers

➤ *Move the virus from one barn to the other one*

■ Third, the F. Ménard service men

➤ *Vaccination crew*



Devil is in the details

1. Poor truck sanitation and cold weather is famous for PEDv introduction
2. Lack of producers biosecurity compliance help to the transmission of the virus
3. Late detection has a multiplication effect
4. Very easy to contaminate materials

The good news

■ No sow herds infected!

➤ F. Ménard trailer

□ Good sanitation procedure

❖ *A star to the trucker*


➤ The 5 sow farms

□ Good respect of biosecurity rules kept the virus out

We can find the virus everywhere !!!

PED PCR positive environmental samplings

Deep pit	+++	Farm loading dock	++
Floor	+++	Producer's truck	++
Pen wall	++	Pressure washer	++
Farm office	+	Service man truck	+
Entrance of barn	+	Abattoir loading dock	+
Outside barn	+	Truck washing bay	+
Attic	+		



March 2015 – F. Ménard

- 12 sites with positives pigs
- 22 barns
- > 20 000 pigs – PEDv +

September 2015

- **Completely eradicated**



Secrets of our eradication at F. Ménard

1. Biosecurity improved at all level

- Positives sites considered at « high risk »

2. Strict all in – all out

3. Time is the clue

4. Sanitation – Sanitation – Sanitation

- **Clean is never clean enough**



SHSPHOTOGRAPHY / THINKSTOCK

Canada's fight against **PEDV**

By Lorne McClinton
and Suzanne Deutsch

Unlike in the United States, porcine epidemic diarrhea virus (PEDV) has only been a minor scourge

province of Ontario where 64 of the 71 primary, and all of the 100 secondary, outbreaks were reported. Manitoba had four primary cases, Quebec had two, and one case has been reported in Prince Edward Island. (As in the

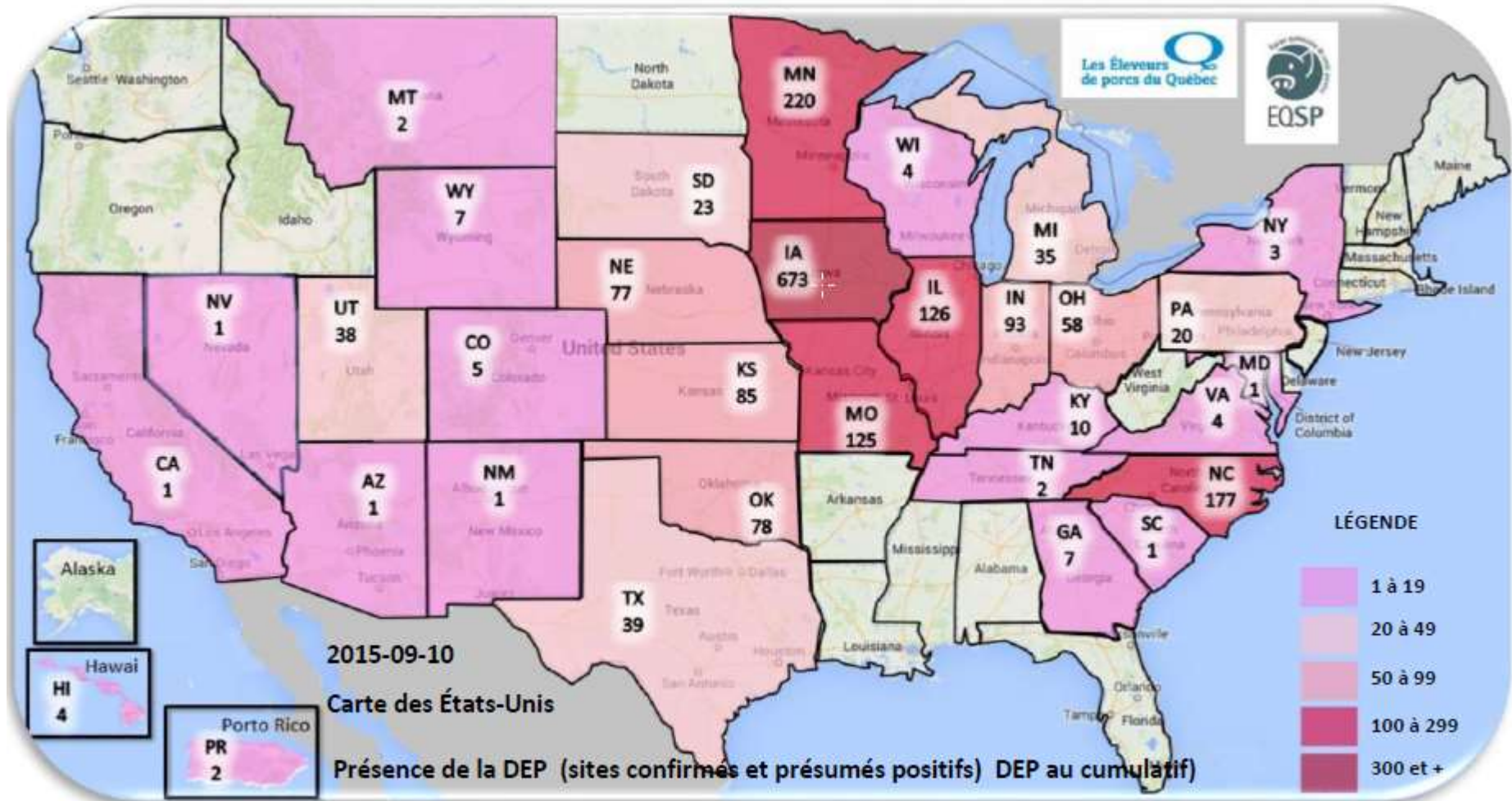
September 2015 – The Canadian situation



2% sow herds

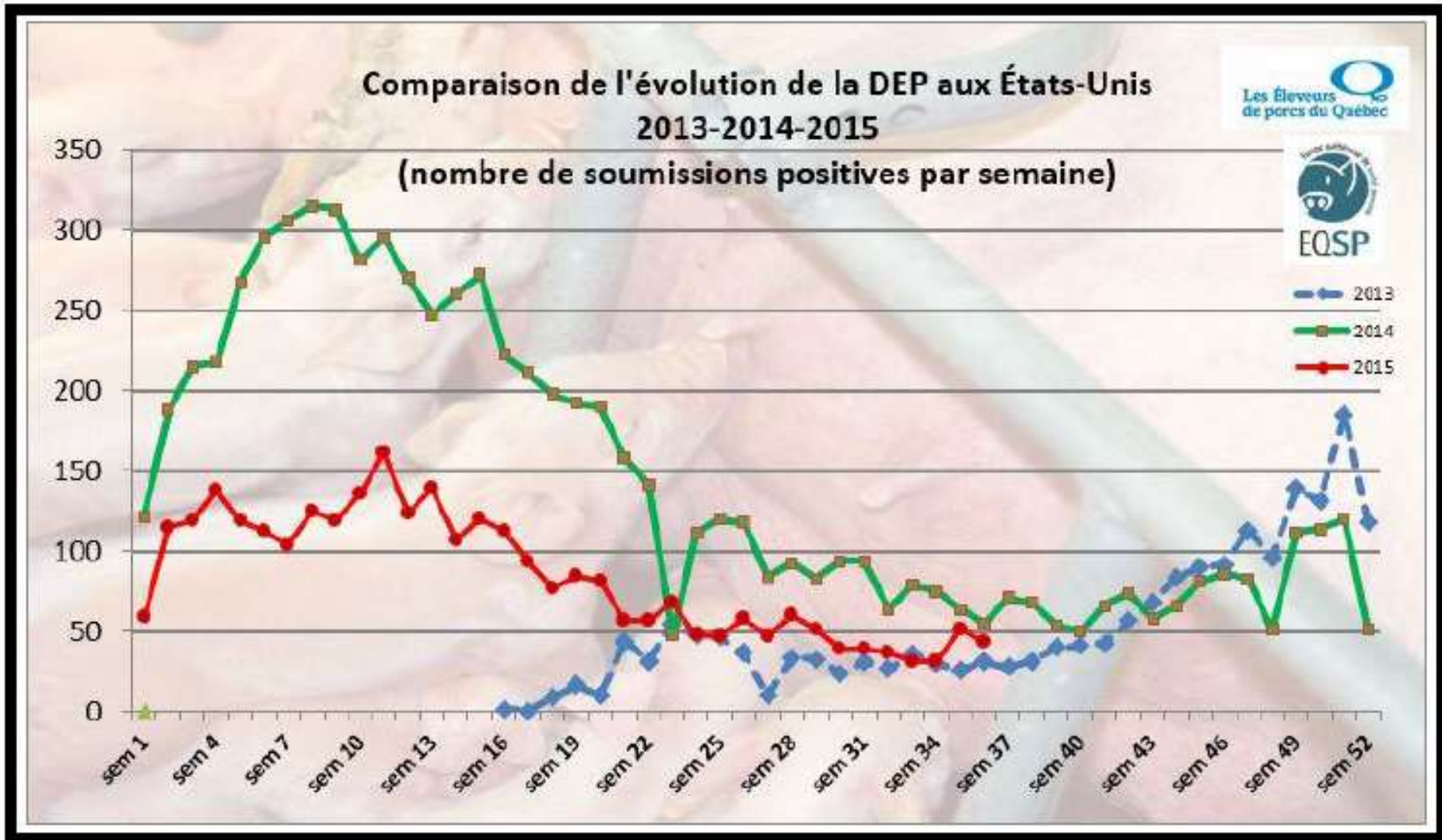
77% are now negatives – 23% Elimination process

September 2015 – U.S. situation



60% sow herds
32 states

September 2015 – U.S. situation





Declines in PED Raise Hope for Eventual Eradication

June 10, 2015 —

The director of swine health research with National Pork Board suggests, if the decline in PED cases continues at its current rate, the U.S. will be in a better position in 2016 to consider a national strategy for eliminating the virus. [Source: Farmscape for June 9, 2015, Bruce Cochrane]

Porcine Epidemic Diarrhea was first identified in May 2013 in the U.S., the infection has since affected over 50% of U.S. sow herd in at least 33 different states, encompassing the majority of swine producing states, there have been cases in Canada, although not nearly as many as in the U.S., and also in Mexico. Dr. Lisa Becton, the director of swine health research with the National Pork Board, reports the infection peaked in 2013 and 2014, and has started to decline in 2015, and the hope is that trend will continue through the rest of this year and into next year.



PEDv Control and elimination projects

■ Provincial and Canadian entities

OSHAB, EQSP, CSHB

- **Their roles :**
 - Surveillance
 - Communication
 - Containment plan
 - Elimination plan



What we learned? **PED in Canada**

Risk factors :

1. Infected farms
2. Poor truck sanitation
3. Contaminated abattoir loading dock

Slaughter Plant Study RESULTS

USA 2014

Plant	Samples	Contaminated at Entry	Contaminated at Plant	Trailers
A	178	9.0%	7.3%	89
B	204	3.9%	9.2%	102
C	166	12.0%	14.5%	83
D	192	5.2%	1.1%	96
E	200	18.0%	17.9%	100
F	198	69.7%	67.7%	99
G	200	2.0%	1.0%	100
Grand Total	1338	17.3%	11.4%	669

Lowe et al, 2014

11 of every 100 negative trailers left plant PEDv positive



What we learned? **PED in Canada**

Risk factors :

1. Infected farms
2. Poor truck sanitation
3. Contaminated abattoir loading dock
4. Assembly yards : comingling/no AI-AO
5. People and poor biosecurity



My advices to Italy and European member states :

1. Surveillance diagnostic
 - Importance of repeat testing
2. Reportable disease
3. Be prepared

PLAN D'ACTION

Diarrhée Épidémique Porcine



Janvier 2015



My advices to Italy and European member states :

1. Surveillance diagnostic
 - Importance of repeat testing
2. Reportable disease
3. Be prepared
4. Focus on truck sanitation
5. Farm biosecurity ↑↑↑

Our role as practitioners

To keep PED out of the breeding herds



Thanks to F. Ménard production team

