67th EAAP Annual meeting – Belfast, UK
29th August – 2nd September 2016

Prevalence of health and welfare conditions in growing pigs on a farm with high antibiotic usage

A. Diana[1,2], E.G. Manzanilla[2], J.A. Calderon Diaz[2], N. Leonard[1], L. Boyle[2]

[1]School of Veterinary Medicine, UCD, Dublin, Ireland

[2]Teagasc, Moorepark, Fermoy, Co. Cork, Ireland

The Irish Agriculture and Food Development Authority

Introduction

Antibiotics (AB) in pig production

Effective for controlling

Gastrointestinal diseases

Respiratory diseases

Exacerbated by the intensive nature of modern pig production systems (Bengtsson & Greko, 2014)

- Early weaning
- Large group sizes
- High stocking densities/overcrowding
- Competition for access to feed
- Barren environment
- Re-mixing

Introduction

Common practice:

1. re-mixing of pigs between (and sometimes within) stages
2. failure to adhere to a policy of ‘All-In-All-Out’

Too light or weak

Moved to the hospital pens

- Associated challenges will influence the time to slaughter
- Also reflected in welfare problems and other production diseases which are unlikely to be influenced by programmes of AB usage
- Or are they?!!

Effect of removal of AB from the diet on welfare indicators and negative behaviours in weaner pigs

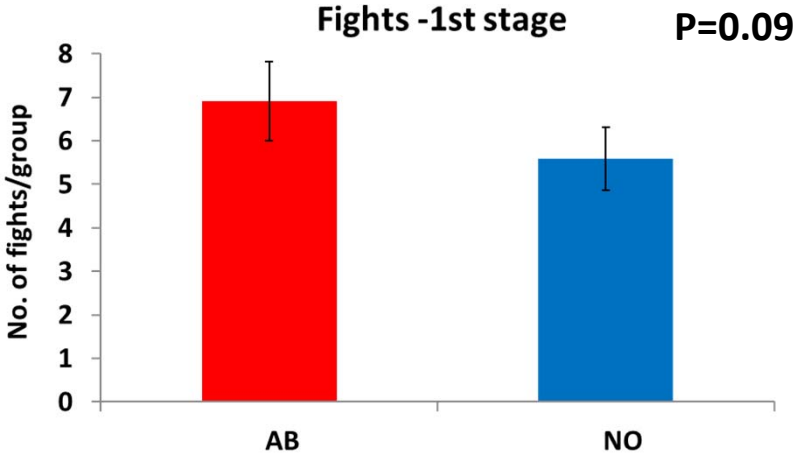
(Diana et al. in prep.)

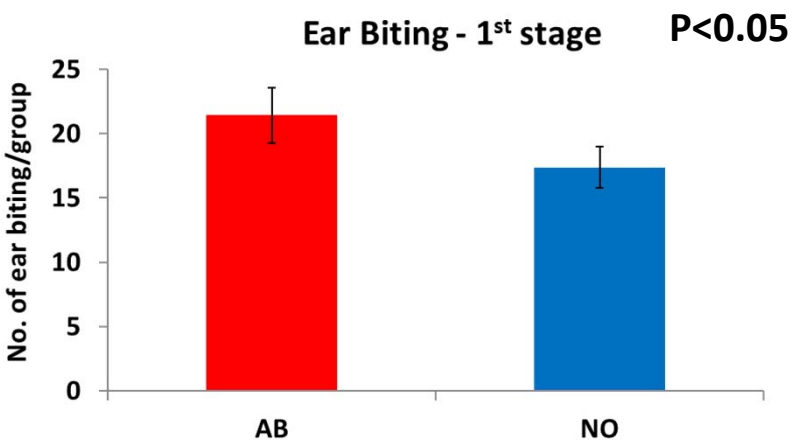
AB

NO AB

- Controlled study conducted on a commercial farm
- 420 pigs weaned over 6 weeks into 12 groups
- Measured welfare lesions and negative behaviours from weaning through the 1st and 2nd weaner stages (9 wks)

Behaviour and welfare lesions



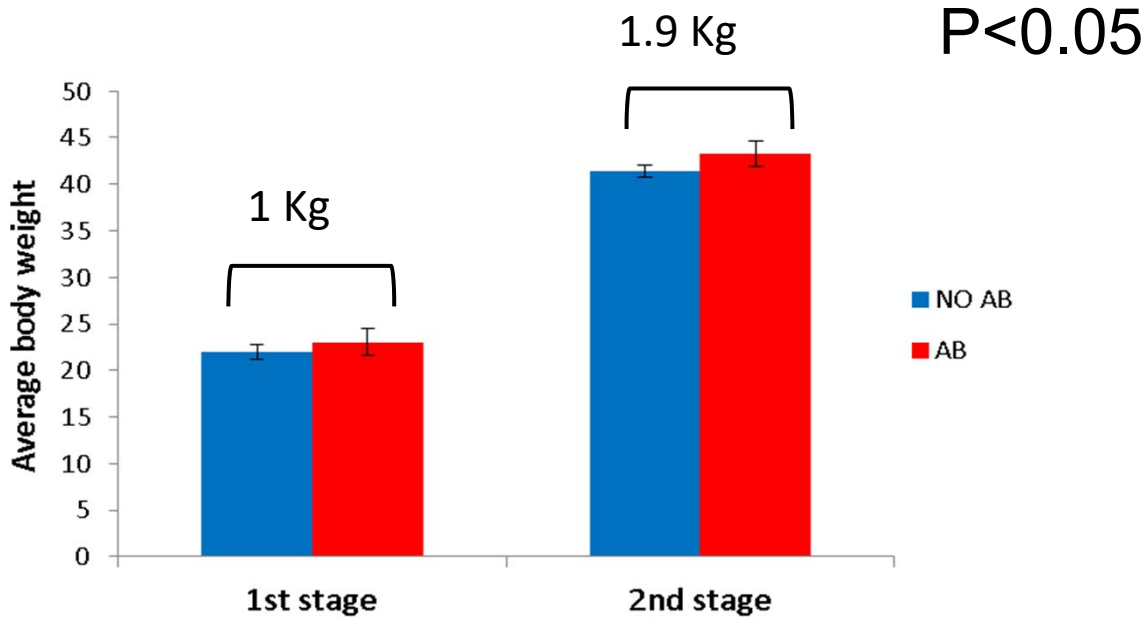


Tail lesions (TL) **P=0.054**

		95% CI	
	OR	Lower	Upper
Ref. NO AB			
AB	1.70	0.97	2.99

- More fights and ear biting (1st stage only) and more tail lesions in pigs with AB in their diet

Bodyweight (kg) of AB and NO AB pigs in the 1st and 2nd weaner stages

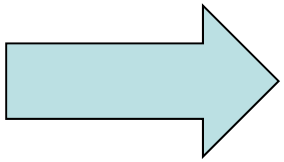


- Higher growth rates, feed intake and ADG (P<0.05) may explain why more aggression & welfare lesions in pigs with AB in their diet → more competition for access to feed?

Conclusions and what we did next

- Clinical indicators of pig health and welfare easy to measure and potentially useful in identifying challenges for pigs during the production cycle
- Could inform more targeted AB plans
- Relationship between pig health, welfare and behaviour is complex and not always predictable
- What is the situation under commercial farm practice?

Conducted a longitudinal study (from farrow to slaughter) on a commercial farm with an intensive in feed AB treatment plan



1050 pigs (84 sows) tagged, weighed and weaned during 1wk in August 2015

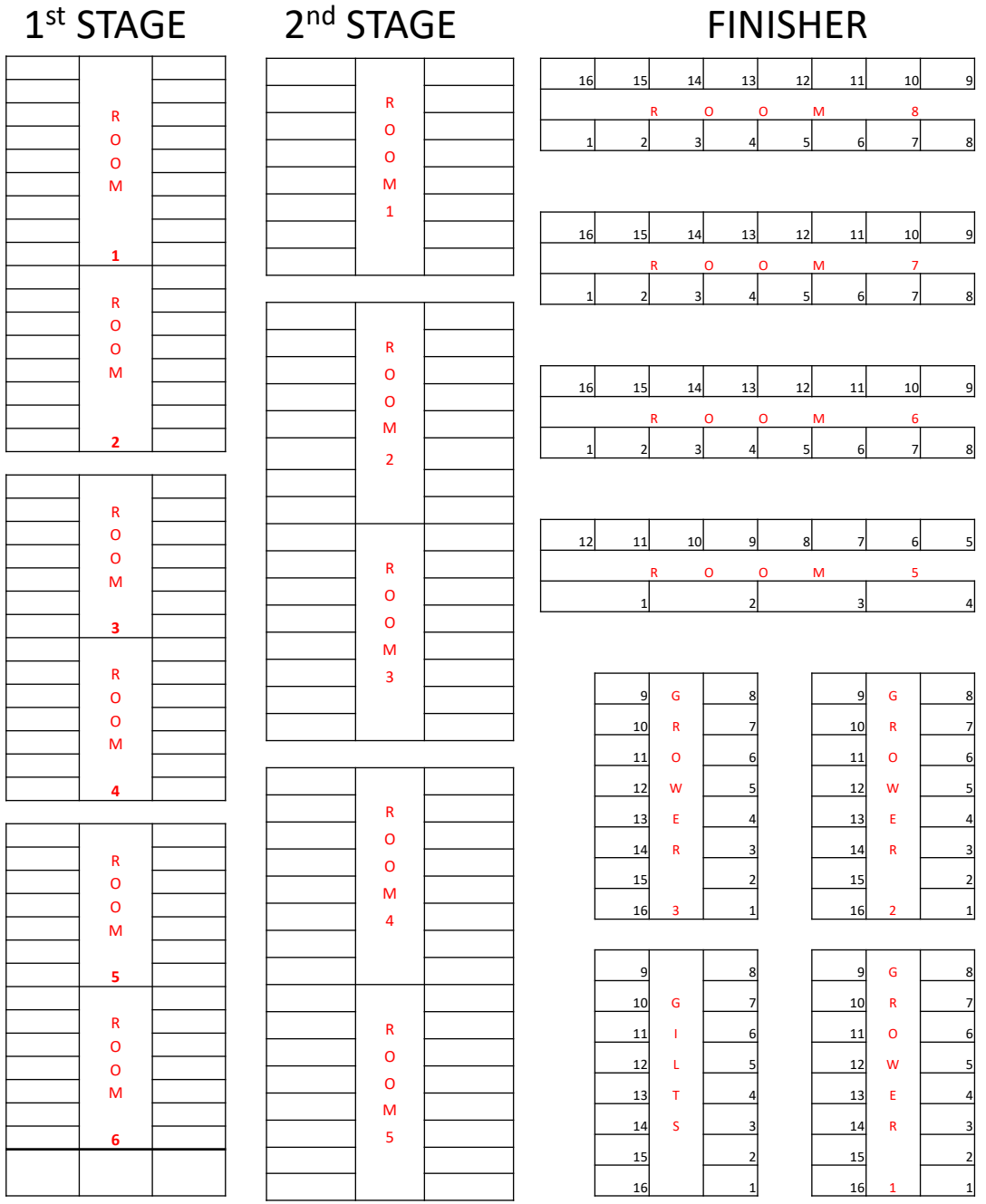
THE FARM

‘All-In All-Out’

5 wks 1st weaner stage

4 wks 2nd weaner stage

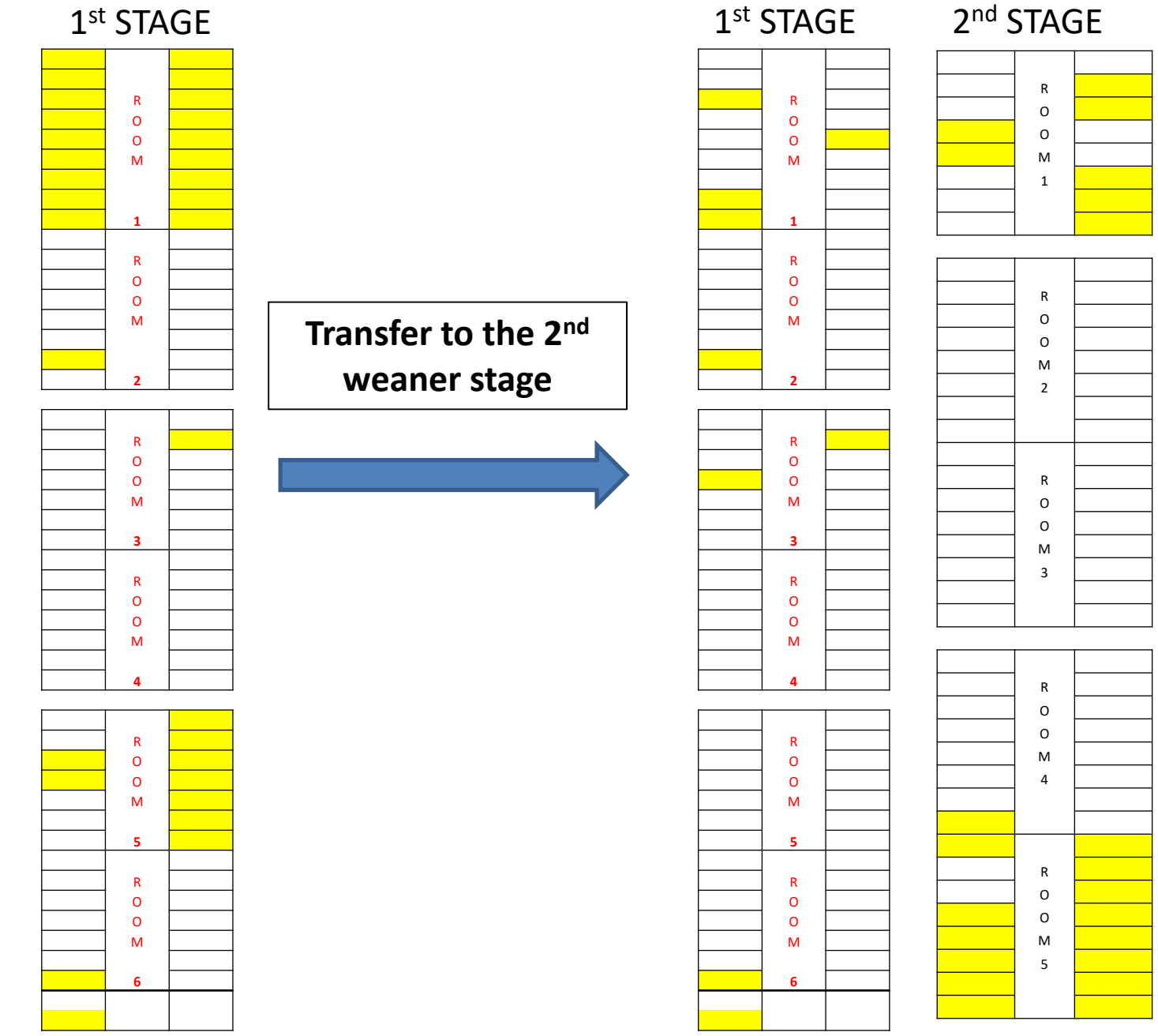
10/11 wks
Finisher stage

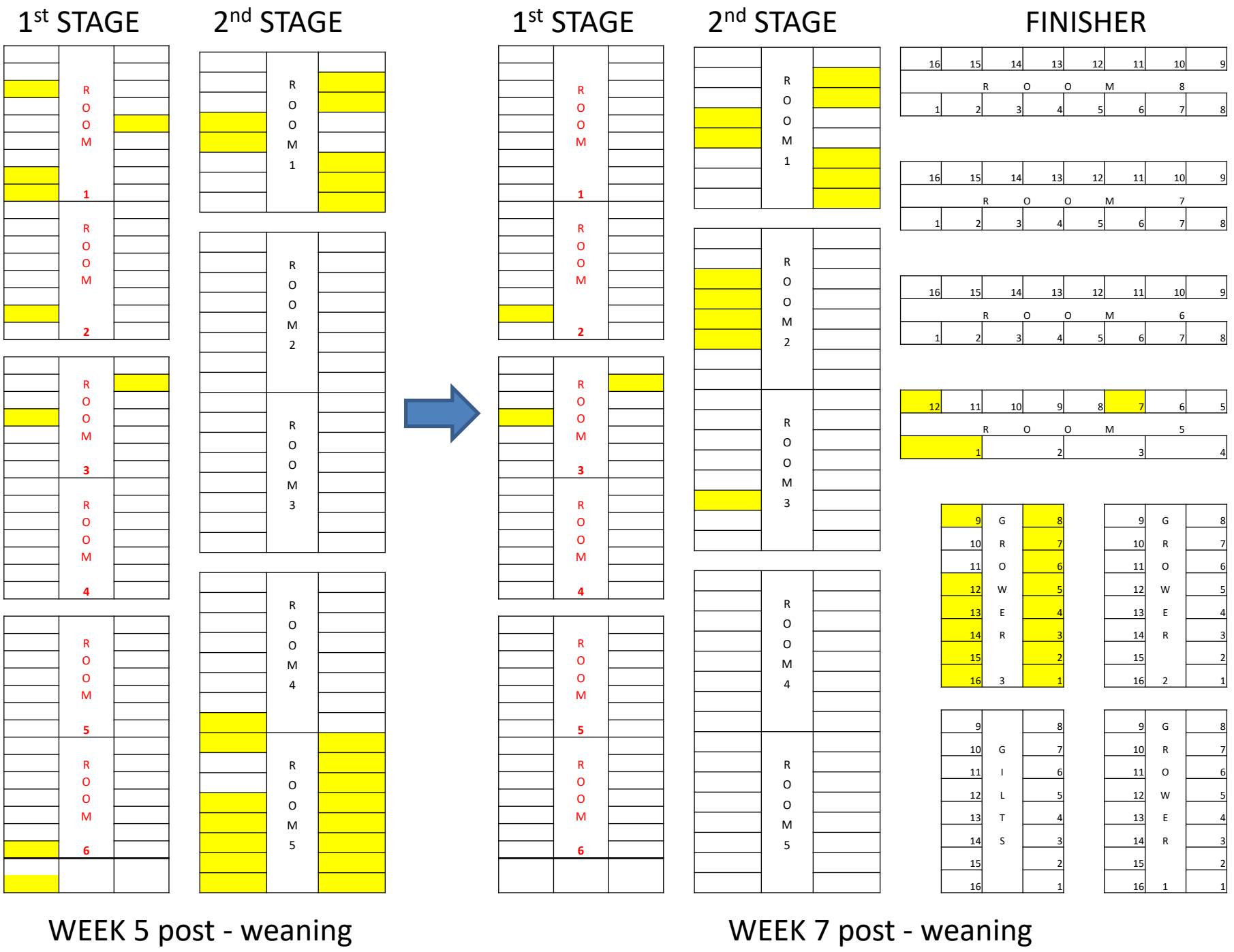


THE FARM

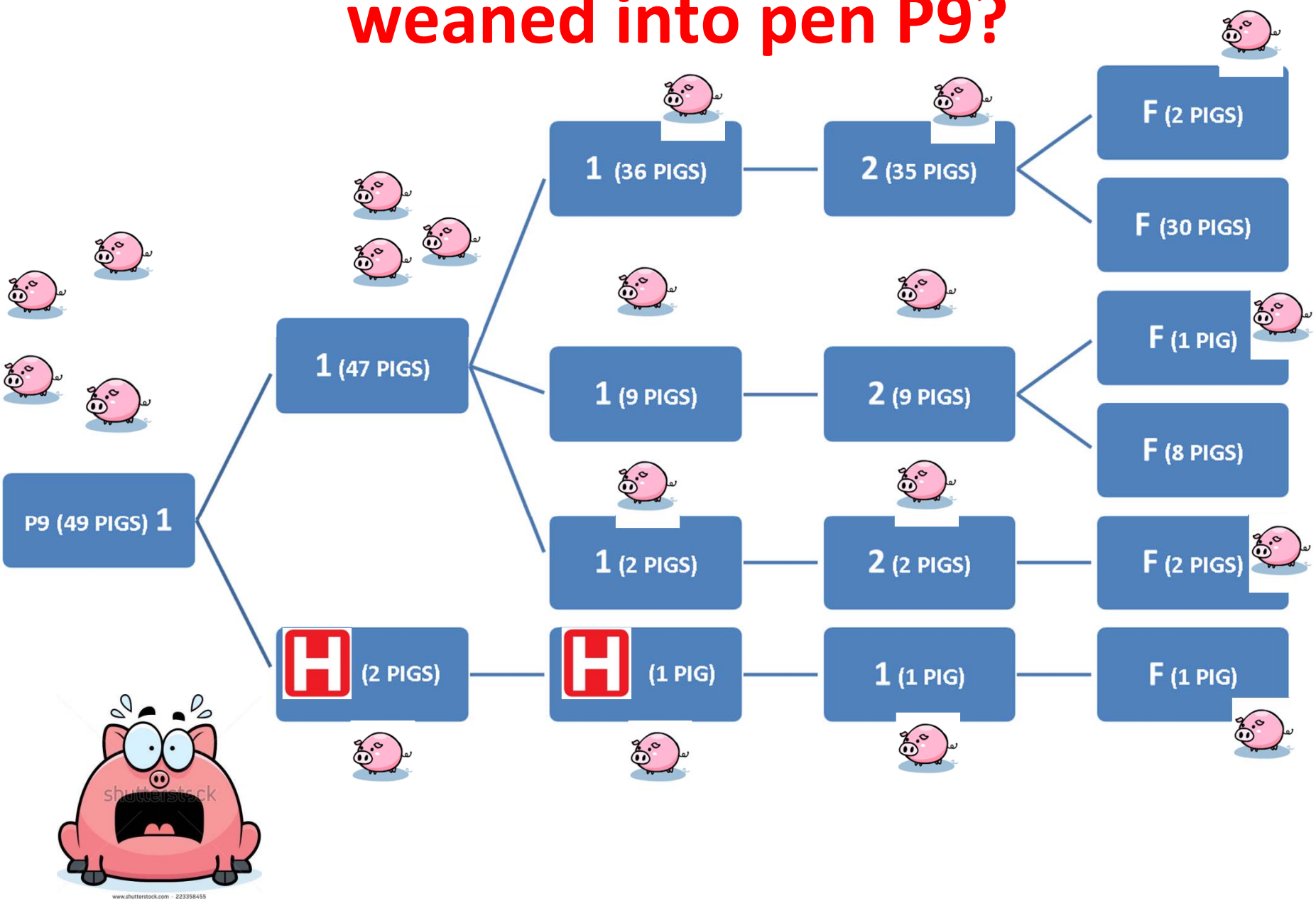
It took 8 weeks to empty the 1st stage weaner house!

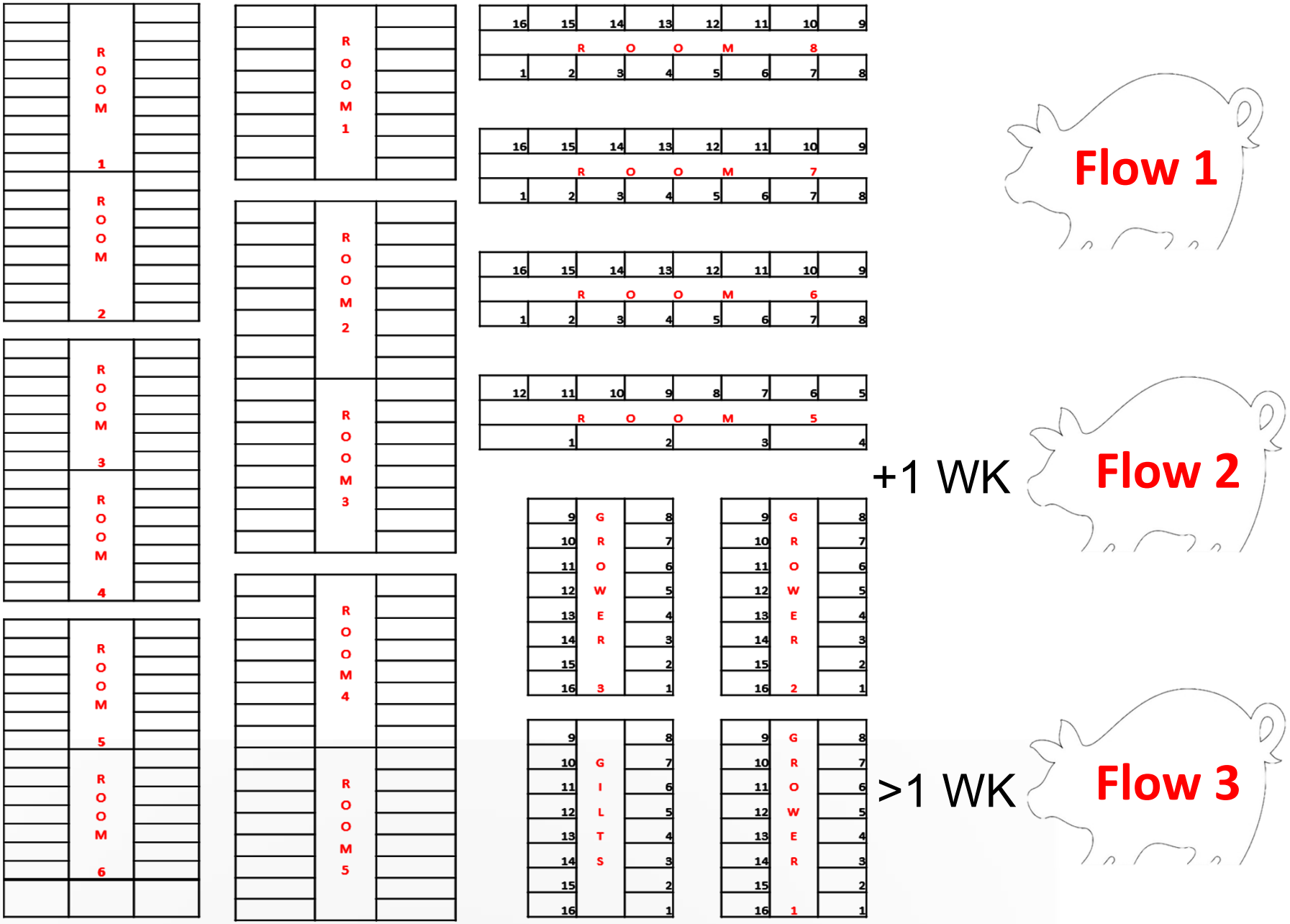
WEEK 9 post - weaning


1st STAGE
ROOM 1
ROOM 2
ROOM 3
ROOM 4
ROOM 5
ROOM 6
Transfer to the 2nd weaner stage
1st STAGE
2nd STAGE
ROOM 1
ROOM 2
ROOM 3
ROOM 4
ROOM 5
ROOM 6
ROOM 1
ROOM 2
ROOM 3
ROOM 4
ROOM 5
WEEK 4 post - weaning
WEEK 5 post - weaning


1st STAGE
2nd STAGE
1st STAGE
2nd STAGE
FINISHER
ROOM 1
ROOM 2
ROOM 3
ROOM 4
ROOM 5
ROOM 6
ROOM 8
ROOM 7
ROOM 6
ROOM 5
GROWER 3
GROWER 2
GILTS
WEEK 5 post - weaning
WEEK 7 post - weaning

What was the fate of pigs weaned into pen P9?

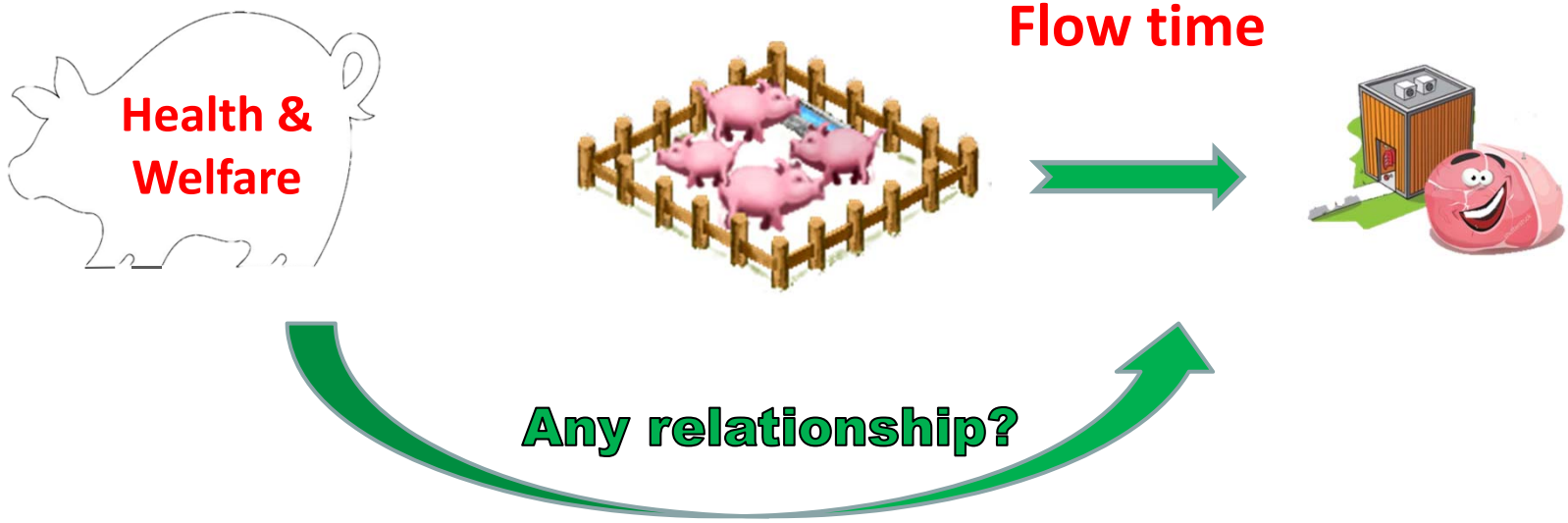



ROOM 1
ROOM 2
ROOM 3
ROOM 4
ROOM 5
ROOM 6
ROOM 1
ROOM 2
ROOM 3
ROOM 4
ROOM 5
16 15 14 13 12 11 10 9
ROOM 8
1 2 3 4 5 6 7 8
16 15 14 13 12 11 10 9
ROOM 7
1 2 3 4 5 6 7 8
16 15 14 13 12 11 10 9
ROOM 6
1 2 3 4 5 6 7 8
12 11 10 9 8 7 6 5
ROOM 5
1 2 3 4
9 GROWER 3 8
10 7
11 6
12 5
13 4
14 3
15 2
16 1
9 GROWER 2 8
10 7
11 6
12 5
13 4
14 3
15 2
16 1
9 GILTS 8
10 7
11 6
12 5
13 4
14 3
15 2
16 1
9 GROWER 1 8
10 7
11 6
12 5
13 4
14 3
15 2
16 1
Flow 1
+1 WK
Flow 2
>1 WK
Flow 3

Hypothesis

Failure to observe ‘All-in All out’ and associated re-mixing has negative implications for pig health, increases the no. days to slaughter and is reflected in clinical indicators of pig welfare

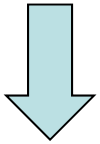
1. To establish the prevalence of health and welfare conditions at each production stage in a farm with intensive AB usage
2. To evaluate the influence of leaving pigs behind the all-in all-out pattern of ‘pig flow’ on indicators of pigs health and welfare



Materials and methods

Case-control study on a commercial farm

A total of 256 pigs were selected and matched by



1. Birth weight; 2. Parity sow; 3. Litter size

Nested case-control study:

Flow 1=128 pigs
Flow 2=64 pigs
Flow 3=64 pigs

Welfare & health data

1. Group (pen) based data: once a week during the entire weaner stage and the first 5 weeks of finisher stage – 10 min x pen



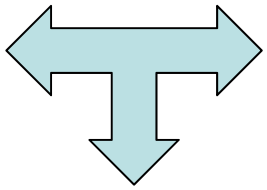

Any other health deviation (hernia, lameness, PBC, bursitis etc.)*

2. Individual data: welfare, health deviations and bodyweight were recorded for each pig at transfer between the stages from weaning to slaughter; lameness was scored before slaughter

*Poor body condition

Data collection at slaughter

Pericarditis



Carcass weight

Enzootic pneumonia score

Carcass tail lesion score

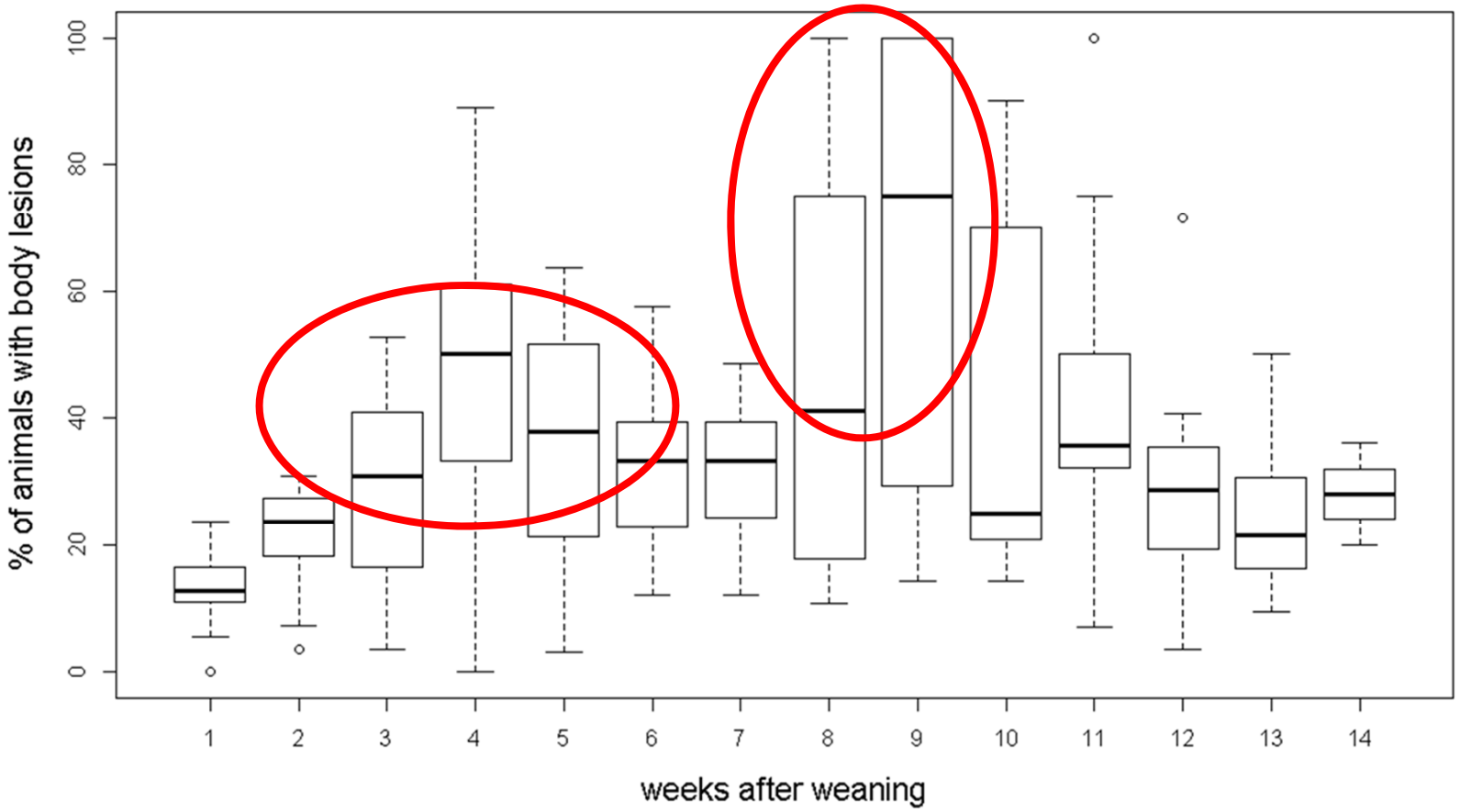
Heart and lungs condemnations

Data were analysed using SAS 9.3

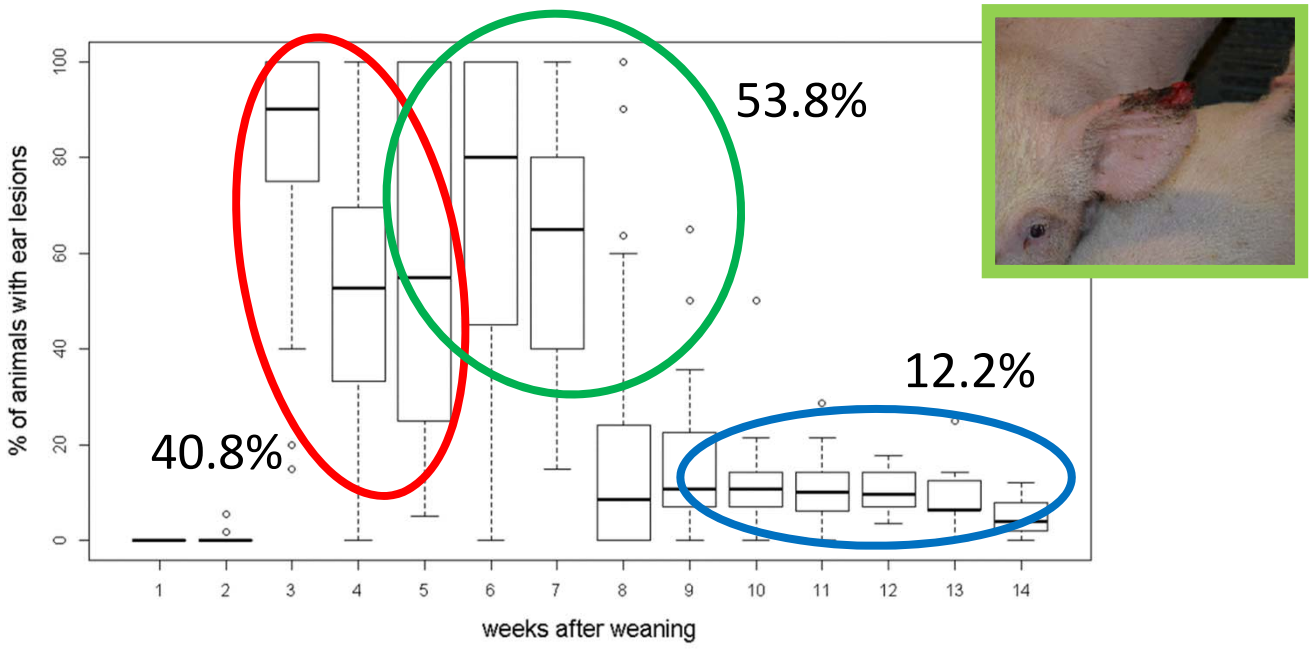
Results

Prevalence of welfare indicators over time

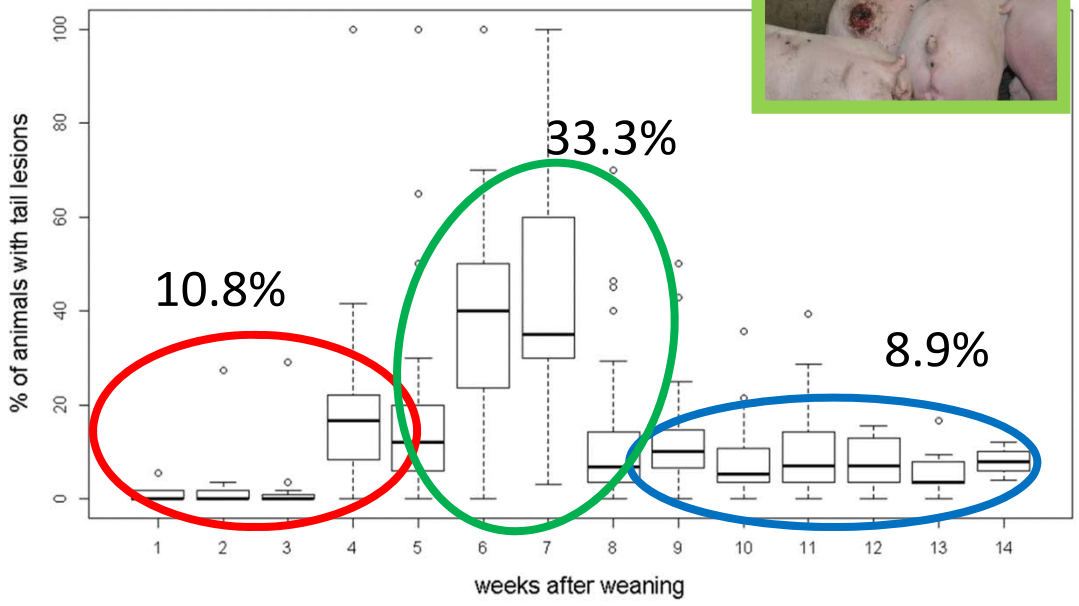
Pattern of body lesions over time



Prevalence of ear and tail lesions over time



Ear lesions were the most prevalent conditions through all the stages, followed by tail lesions

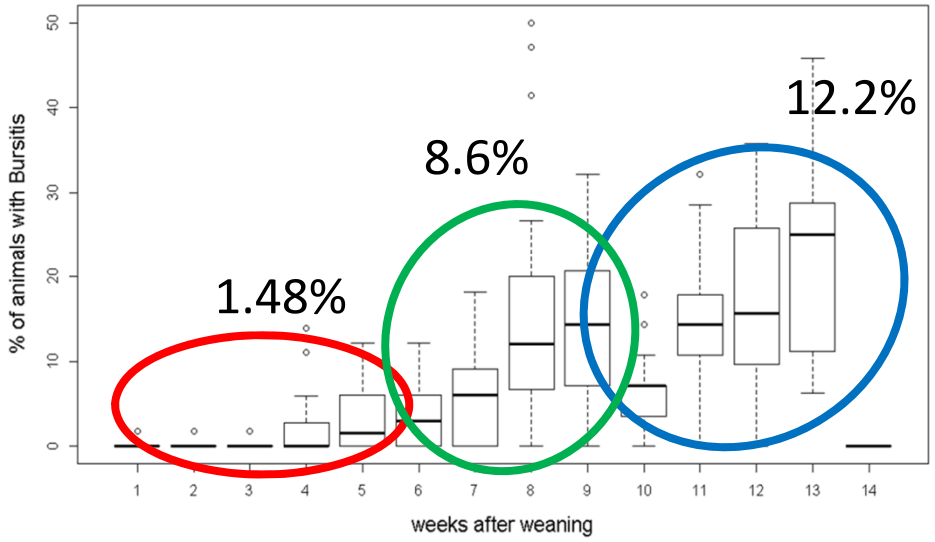


1st stage 2nd stage Finisher

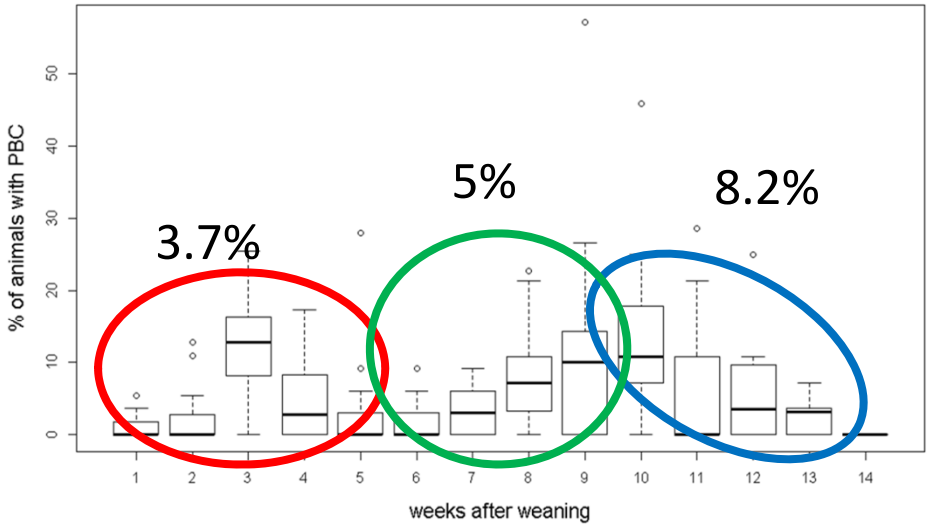
Prevalence of health indicators over time

Prevalence of bursitis, poor body conditions (PBC) and lameness over time

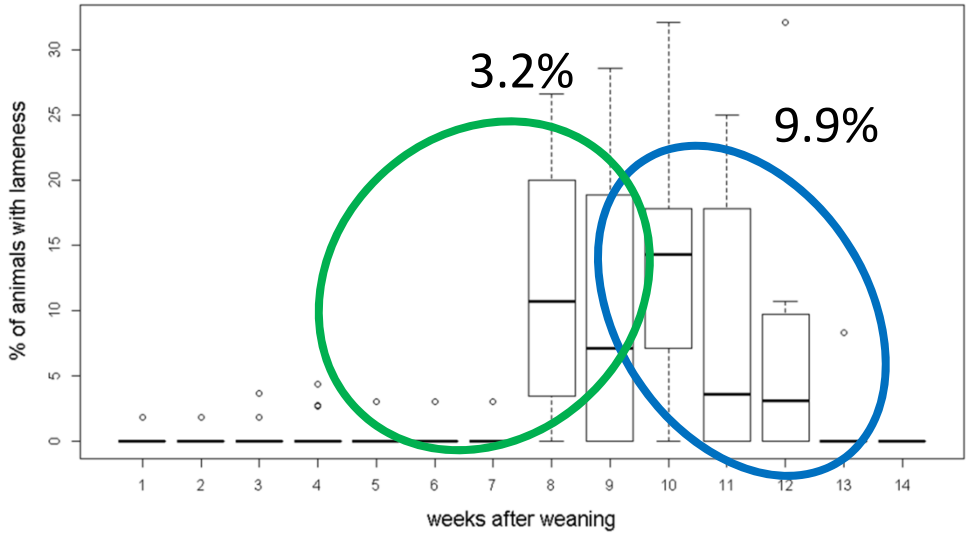
Bursitis



PBC



Lameness



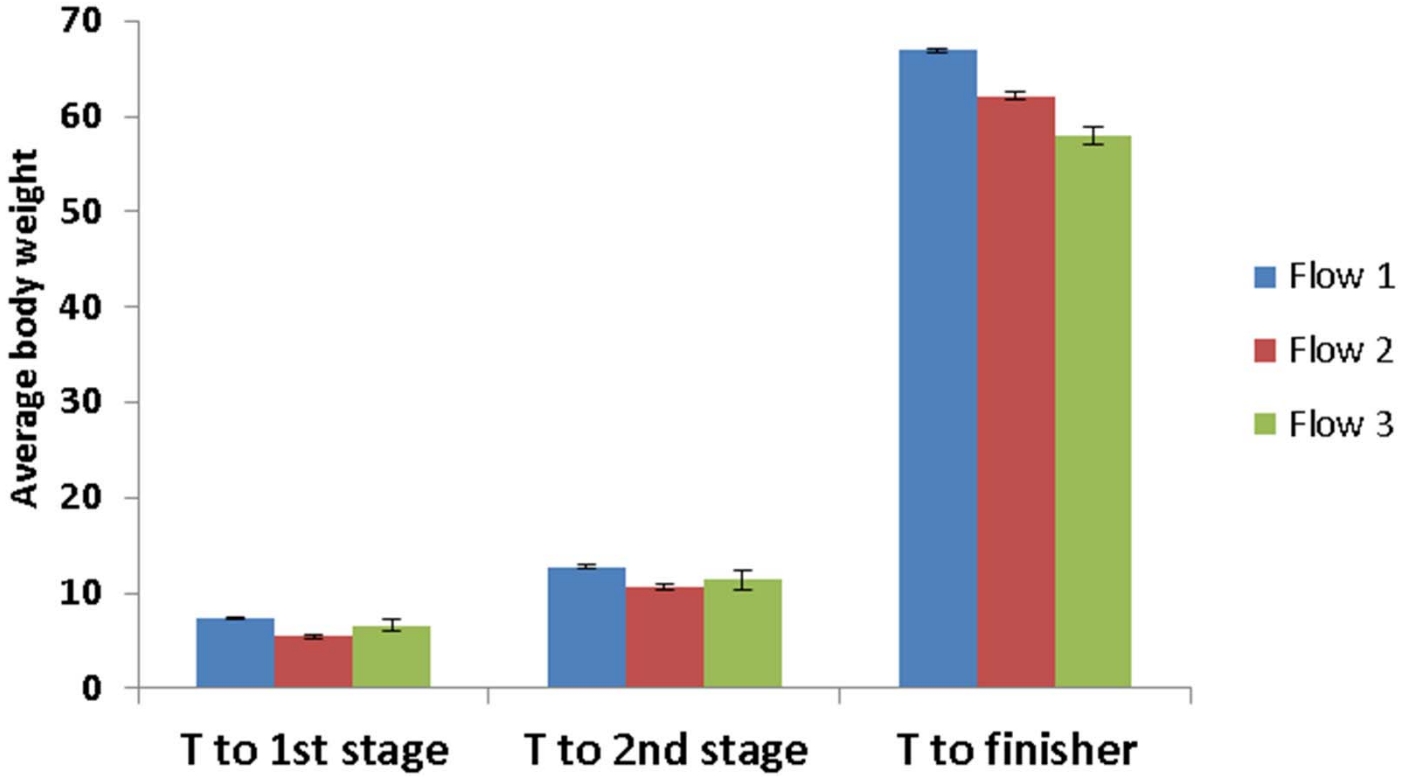
Bursitis, PBC and lameness were the 3 most common conditions through the stages

1st stage 2nd stage Finisher

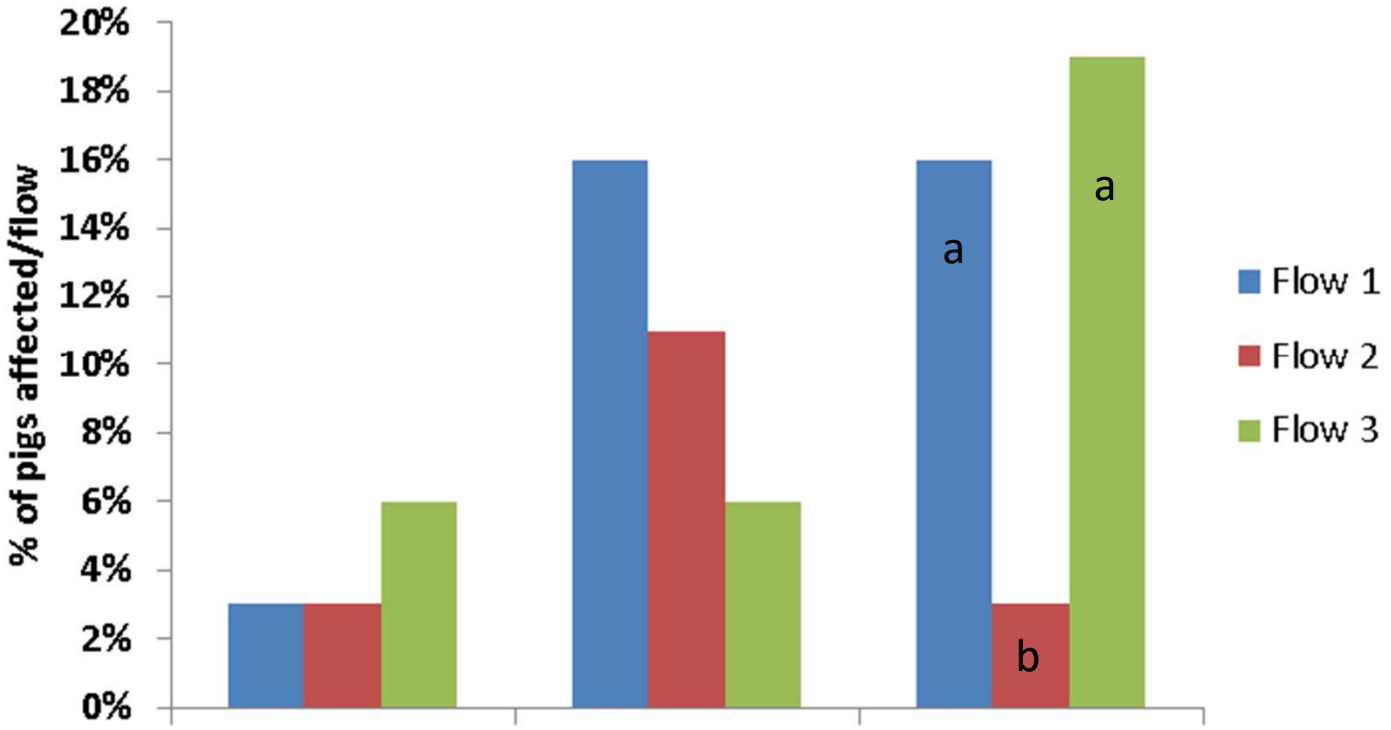
Effect of flows on data collected on individual pigs

Body weight (kg) of pigs at transfer (T) between the stages

P<0.001 **- 9 Kg**



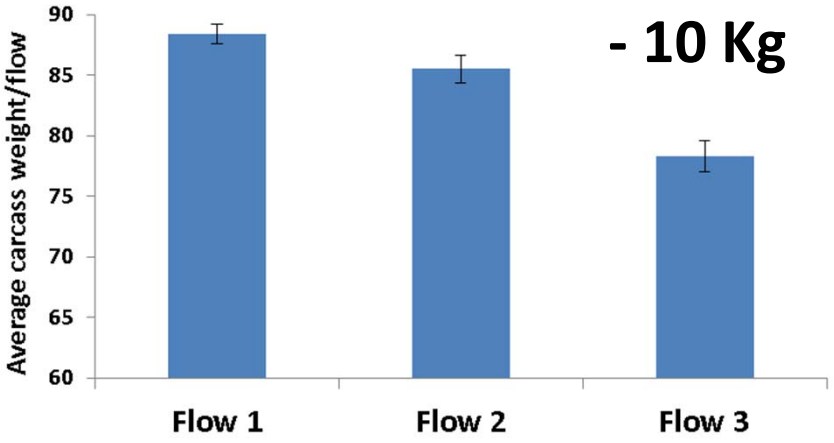
Tail lesions at transfer (T) between the stages



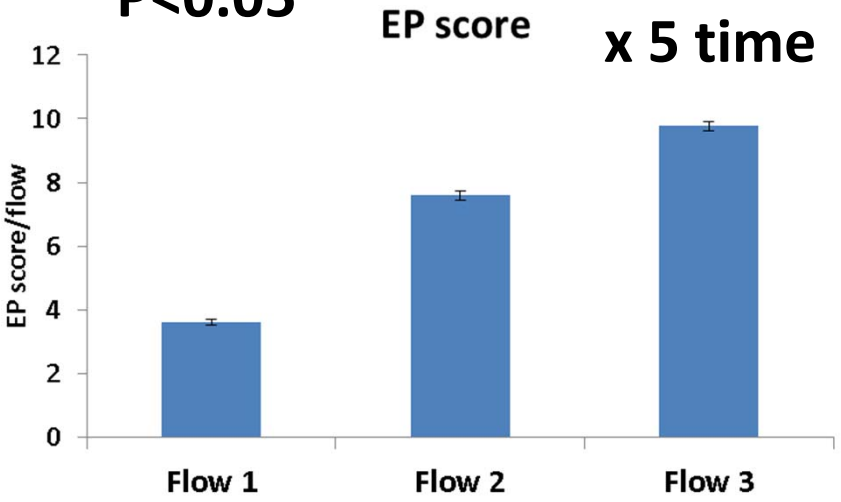
P=0.56 **P=0.11** **P<0.01**

Carcass weight (kg) and health indicators at slaughter

P<0.001

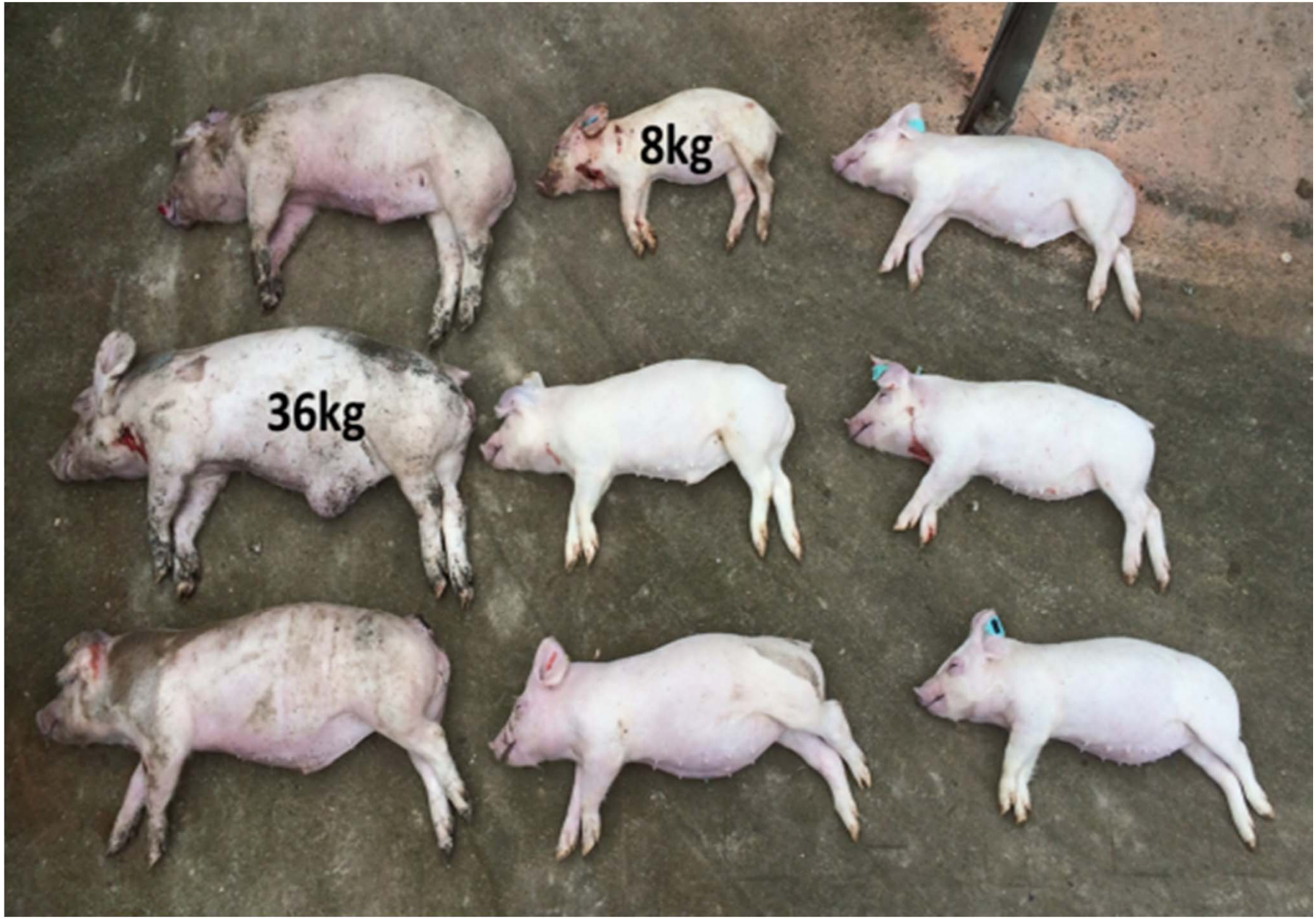


P<0.05



	F1 vs F2		F1 vs F3		F2 vs F3		
		95% CI		95% CI		95% CI	
	OR	Lower-Upper	OR	Lower-Upper	OR	LowerUpper	Pvalue
LAMENESS	**4.05**[a]	1.6-9.86	**7.60**[a]	3.25-17.7	**1.88**	0.87-4.07	**0.002**
PERICARD.	**1.91**	0.66-5.54	**6.66**[a]	2.56-17.3	**3.48**[a]	1.27-9.56	**<0.001**
HEART CONDM.	**1.16**	0.37-3.62	**4.21**[a]	1.61-10.9	**3.62**[a]	1.16-11.3	**0.011**
LUNGS CONDM.	**1.16**	0.58-2.30	**1.56**	0.77-3.23	**1.35**	0.60-3.07	**0.486**
TAIL LESIONS	**0.86**	0.46-1.61	**0.80**	0.40-1.57	**0.92**	0.43-1.98	**0.774**

x 5 time3 time


8kg
36kg

Main findings

- In spite of the high level of in-feed AB, indicators of poor health and welfare were detected at all production stages
- Reflected challenges pigs face throughout the production cycle
- Pigs detained from the normal production ‘all-in all-out’ pattern (i.e. flow 3) had poorer health and reduced body weight
- Explanatory or causative?
- The higher likelihood of heart disease in Flow 3 supports the theory that this practice is associated with re-circulation of disease
- Certain welfare lesions indicators and behavioural abnormalities seem to be associated with fast growth rates/’thriving pigs’ (i.e. flow 1)

Recommendations

- Management and AB treatment plans should be targeted on those animals that have a more complex route to reach slaughter (flow 3 pigs)
- This would help to drastically reduce the amount of in-feed AB
- Targeting management strategies during critical time points may help not only to reduce the occurrence of welfare issues but also to ameliorate health status and thereby reduce the need for AB

Conclusion

May welfare and health indicators be used as a tool to monitor the efficacy of new strategies and management practices?

Acknowledgements

Pig farmers and farm personnel

Students who helped with the data collection

Teagasc team for data collection and analysis

WALSH FELLOWSHIPS PROGRAMME

UCD DUBLIN

teagasc

AGRICULTURE AND FOOD DEVELOPMENT AUTHORITY

Thanks for your attention!