

# Managing the transition sow takes more than 5 days

Feeding trends in Dutch sow herds

**SVINEKONGRES2019**

22.-23. oktober i MCH Herning Kongrescenter

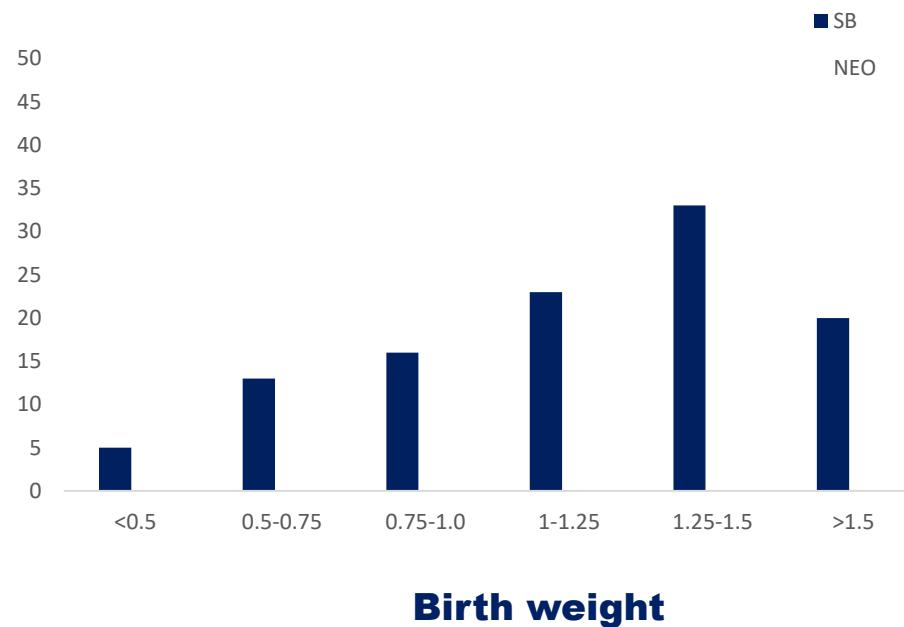
Pieter Langendijk

# We want the transition sow to...

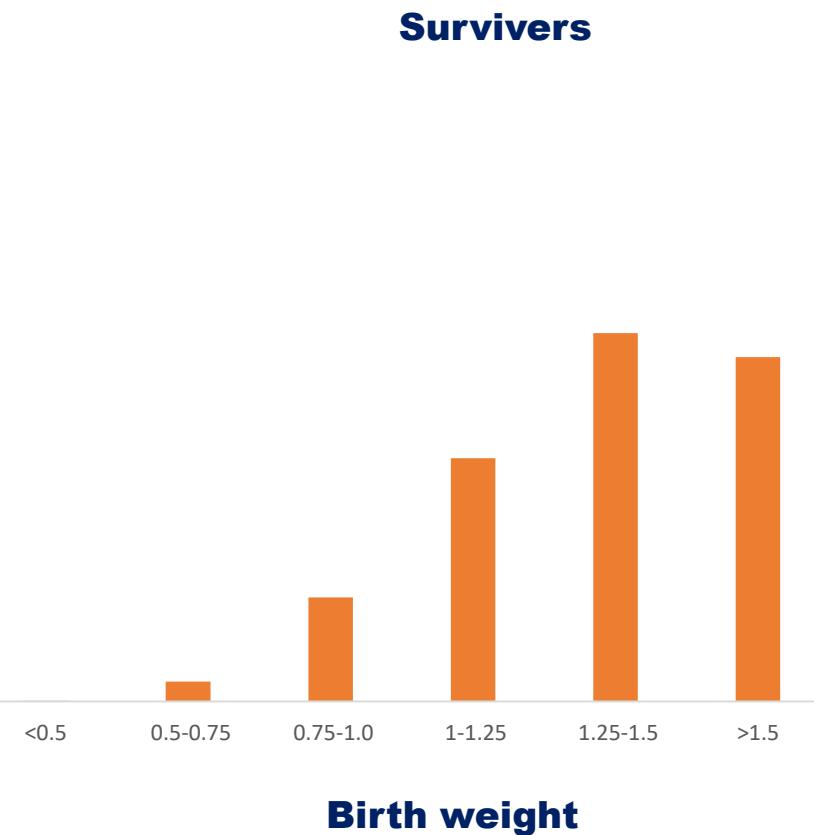
- Give birth to viable piglets
- Be in optimal condition
- Be prepared for lactation
- Perform well in lactation AND next pregnancy



## Stillborn and neonatal mortalities



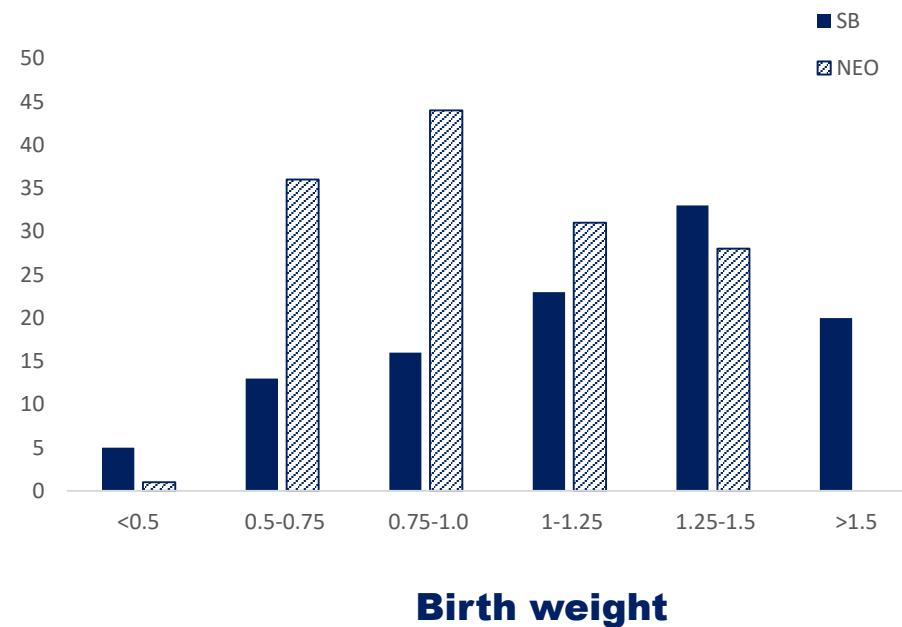
## Survivors



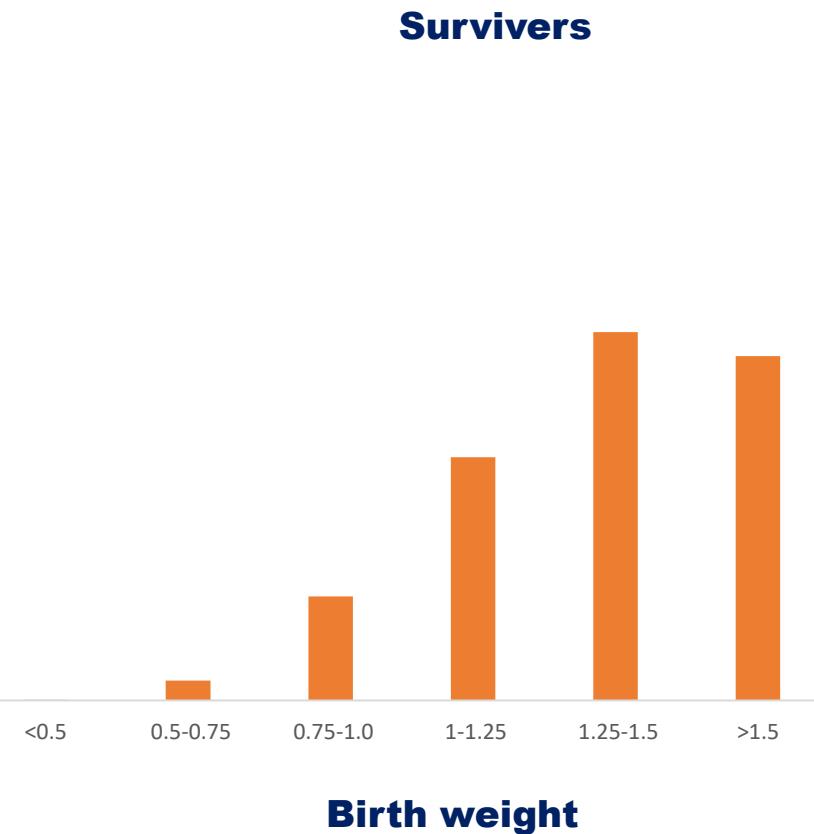
**Stillborn piglets are a random sample of the population,**

**neonatal mortalities are mostly small piglets**

**Stillborn and neonatal mortalities**



**Survivors**



# The farrowing process is what causes stillbirth

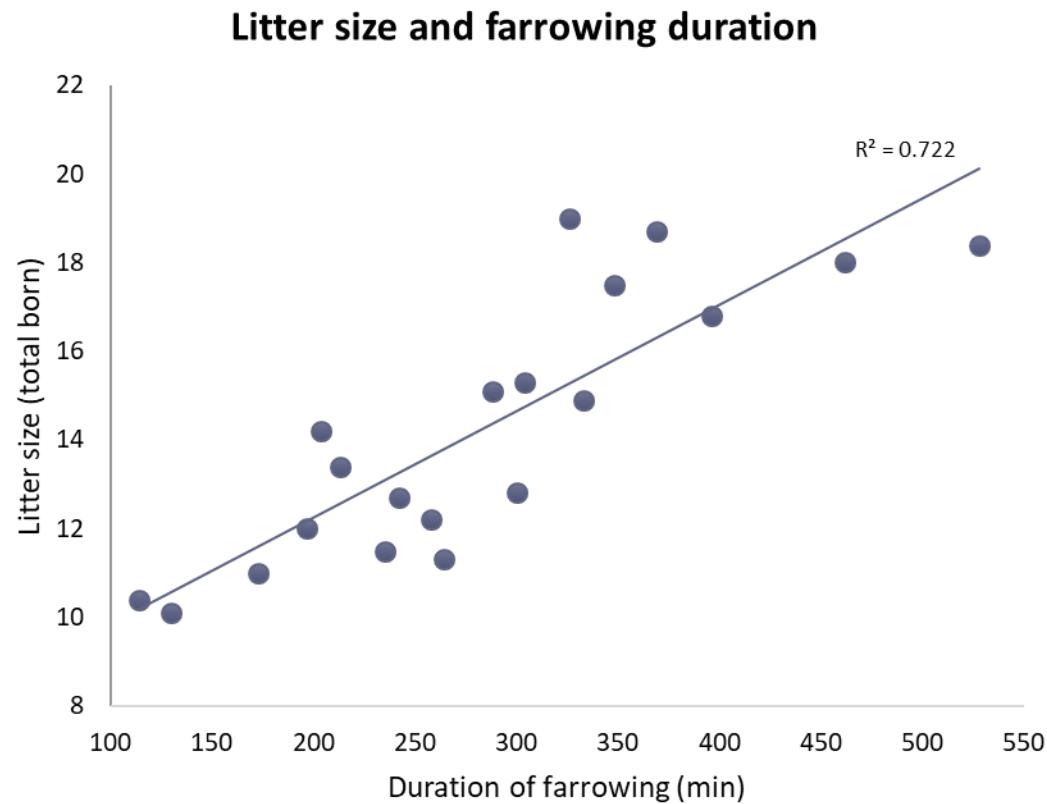
Year	Number of sections	Total born	Stillborn
1978	51	10.2	0.2
1979	49	10.7	0.2
1980	99	11.3	0.2
1981	64	9.8	0.6
1982	72	10.4	0.3
1983	107	10.4	0.2
1984	106	11.0	0.3
1985	61	10.2	0.1
1986	96	10.9	0.1
1987	80	10.3	0.2
1988	71	11.4	0.2
Overall	856	$10.6 \pm 3.2$	$0.2 \pm 0.8$

“Of mature piglets, 98 % are potentially viable at birth.”

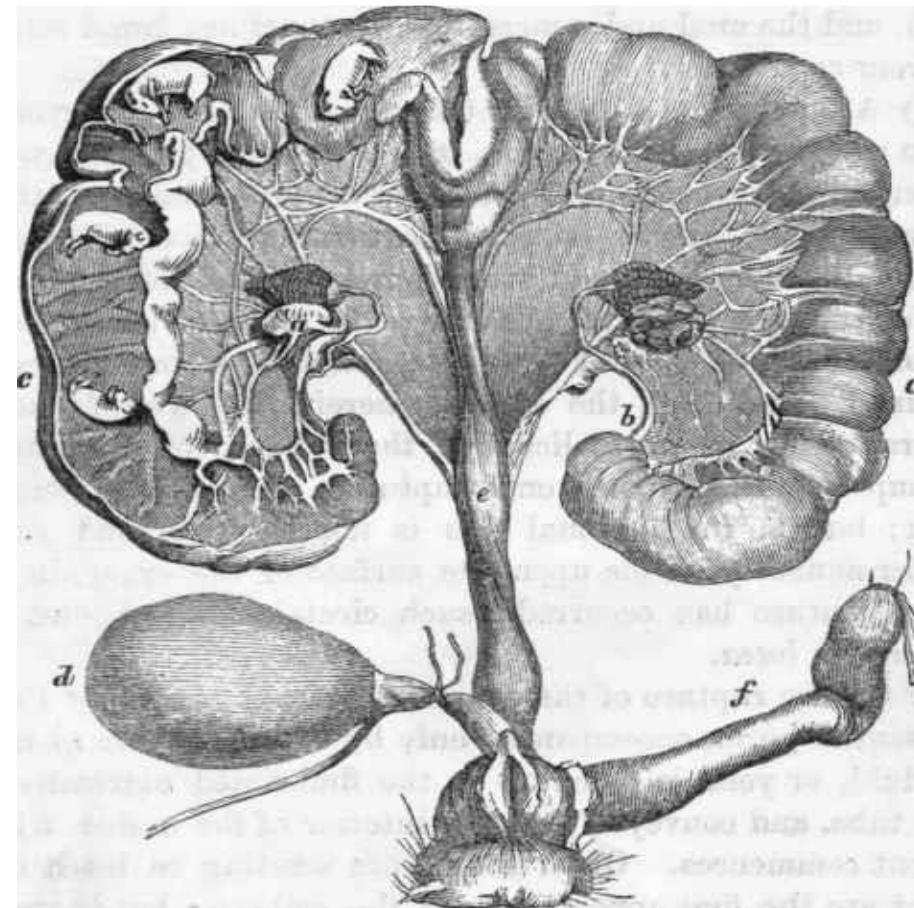
Friendship et al. (1990)

## Cesarean section in the sow: A retrospective analysis of litter size and stillbirth rate

Robert M. Friendship, Kenneth R. Metzger, Nancy P. Robinson, Gordon S. Doig

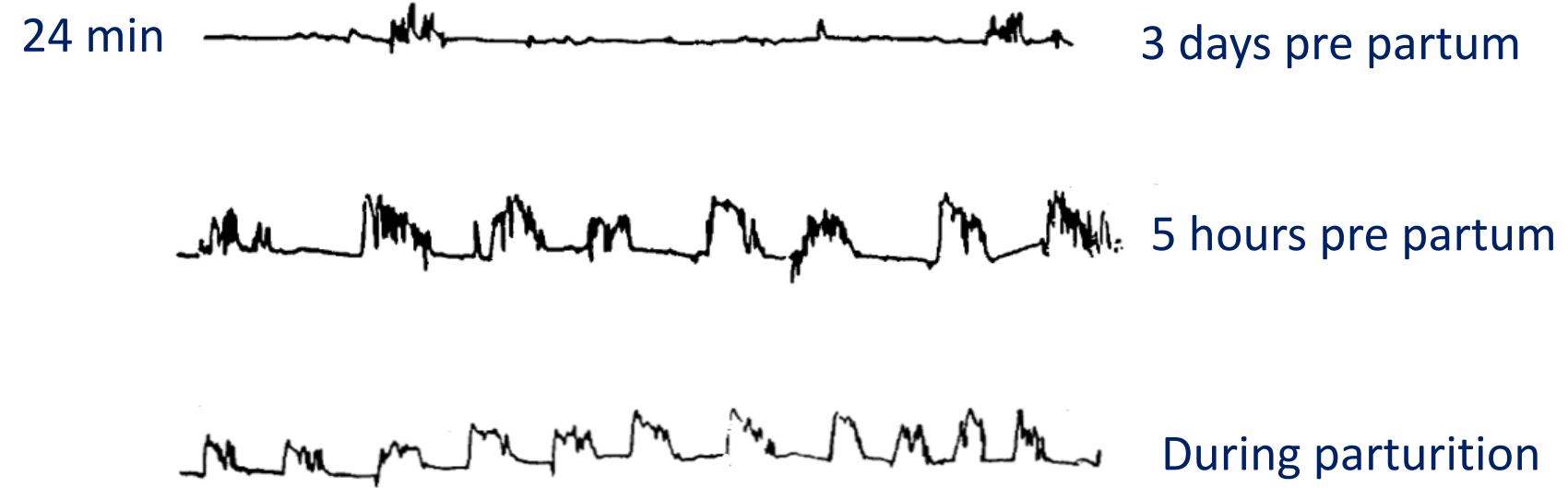


Oliviero et al., 2019

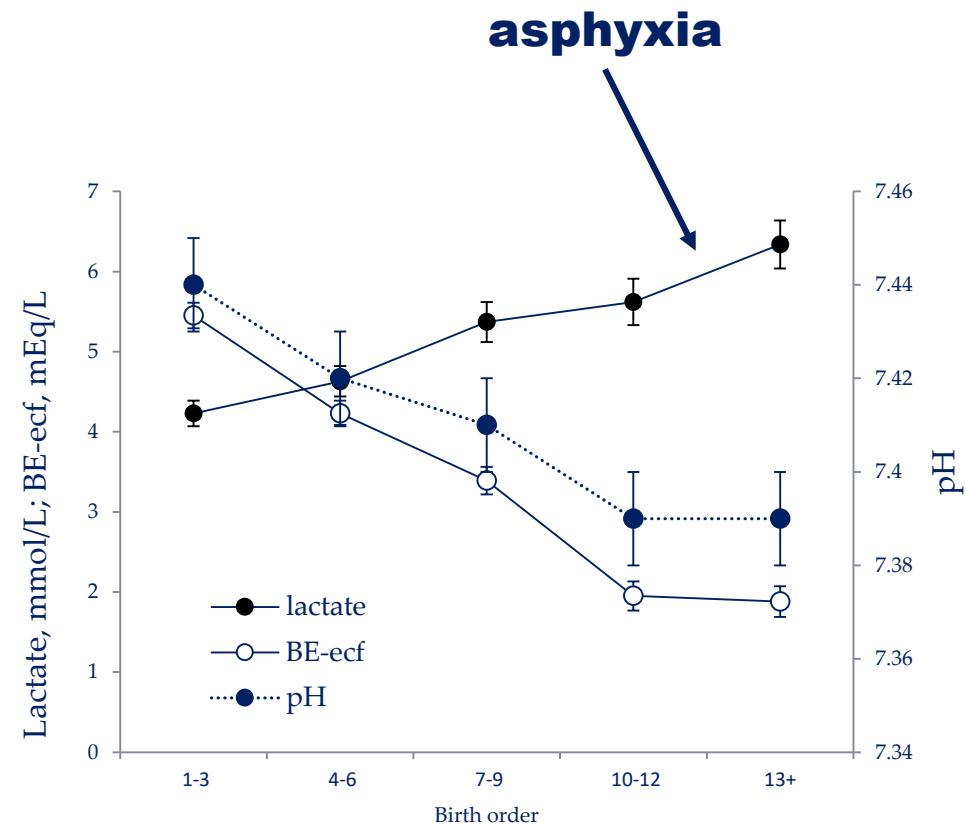
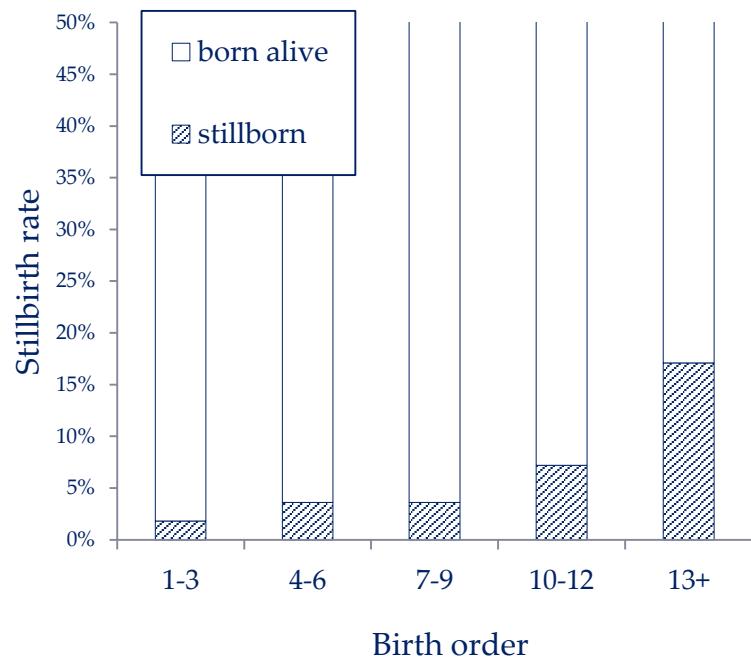


**Thomas Rymer Jones, 1861**

## Uterine contractions before and during parturition



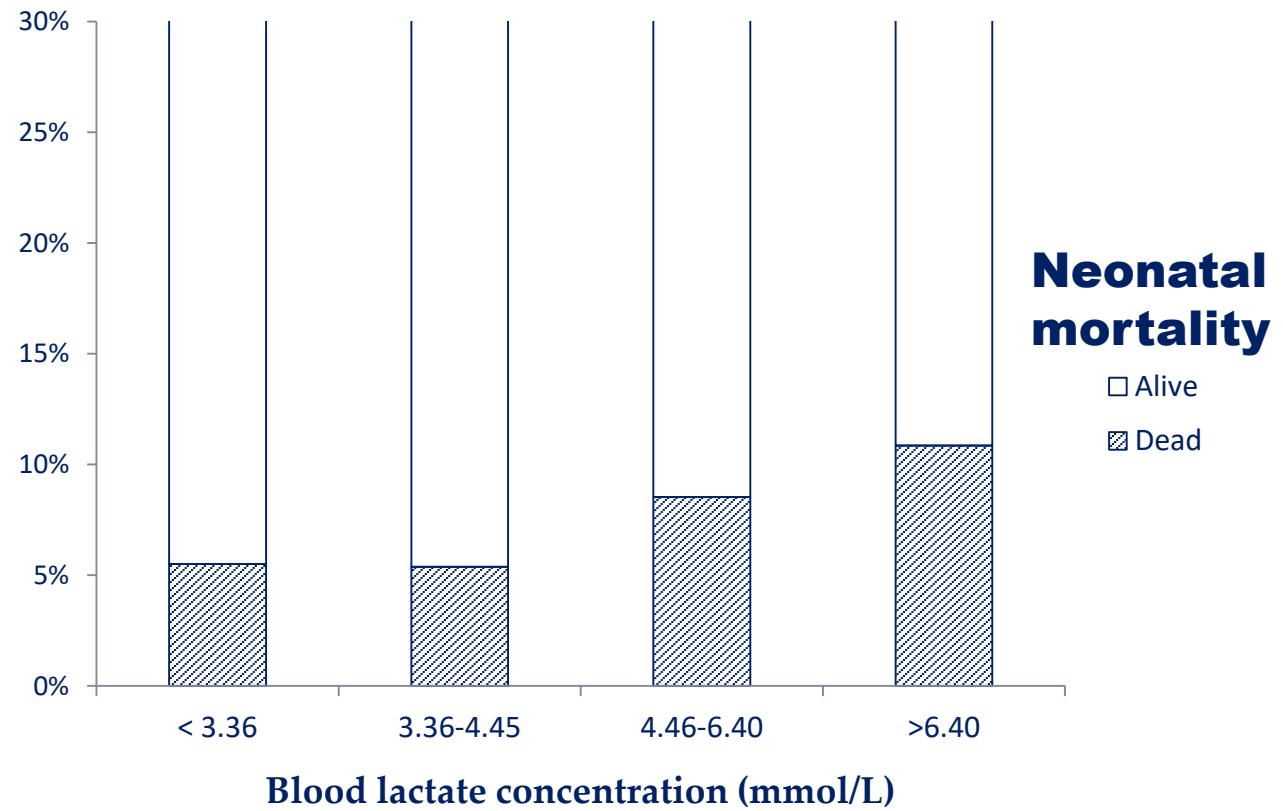
# Birth order and stillbirth

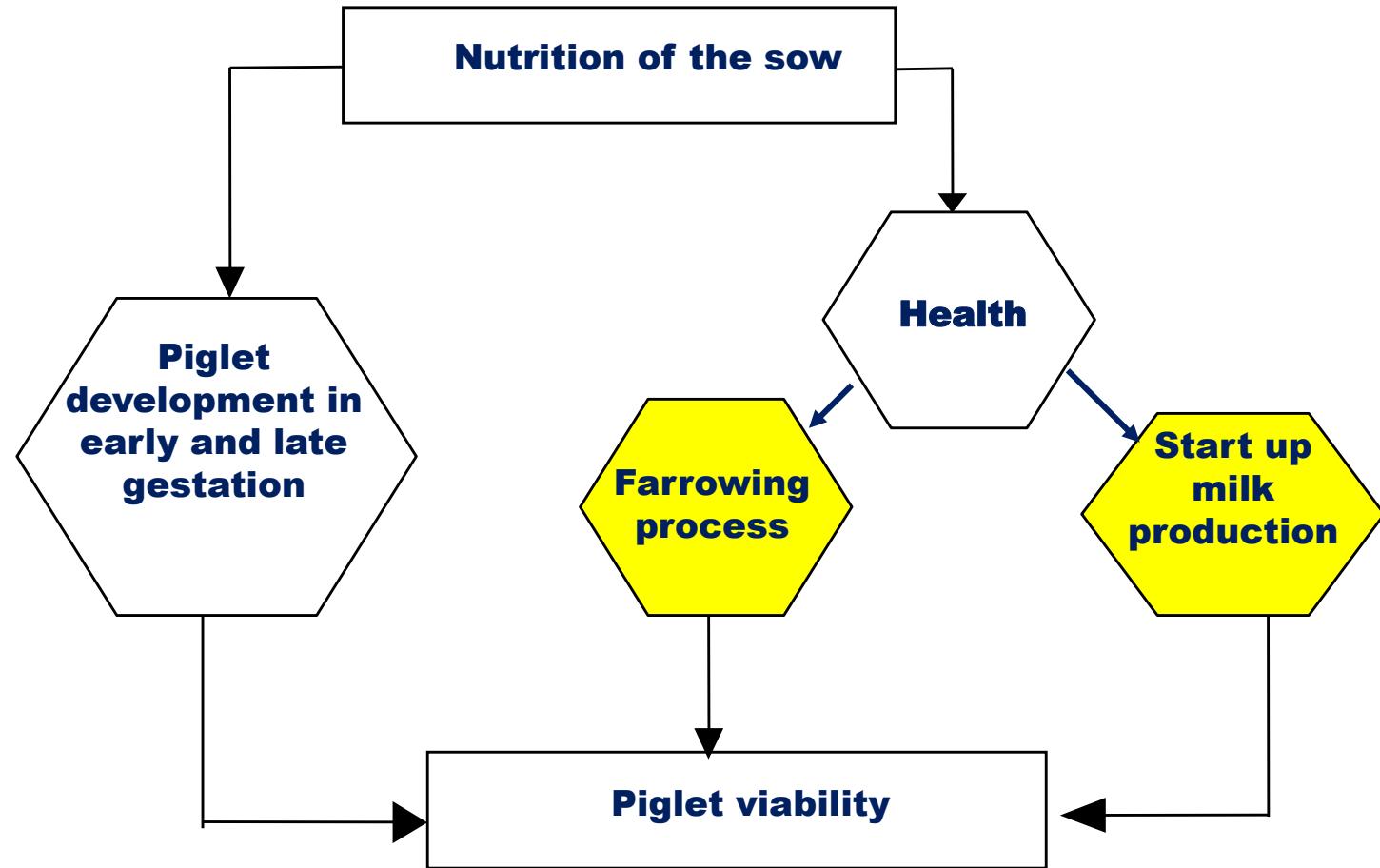


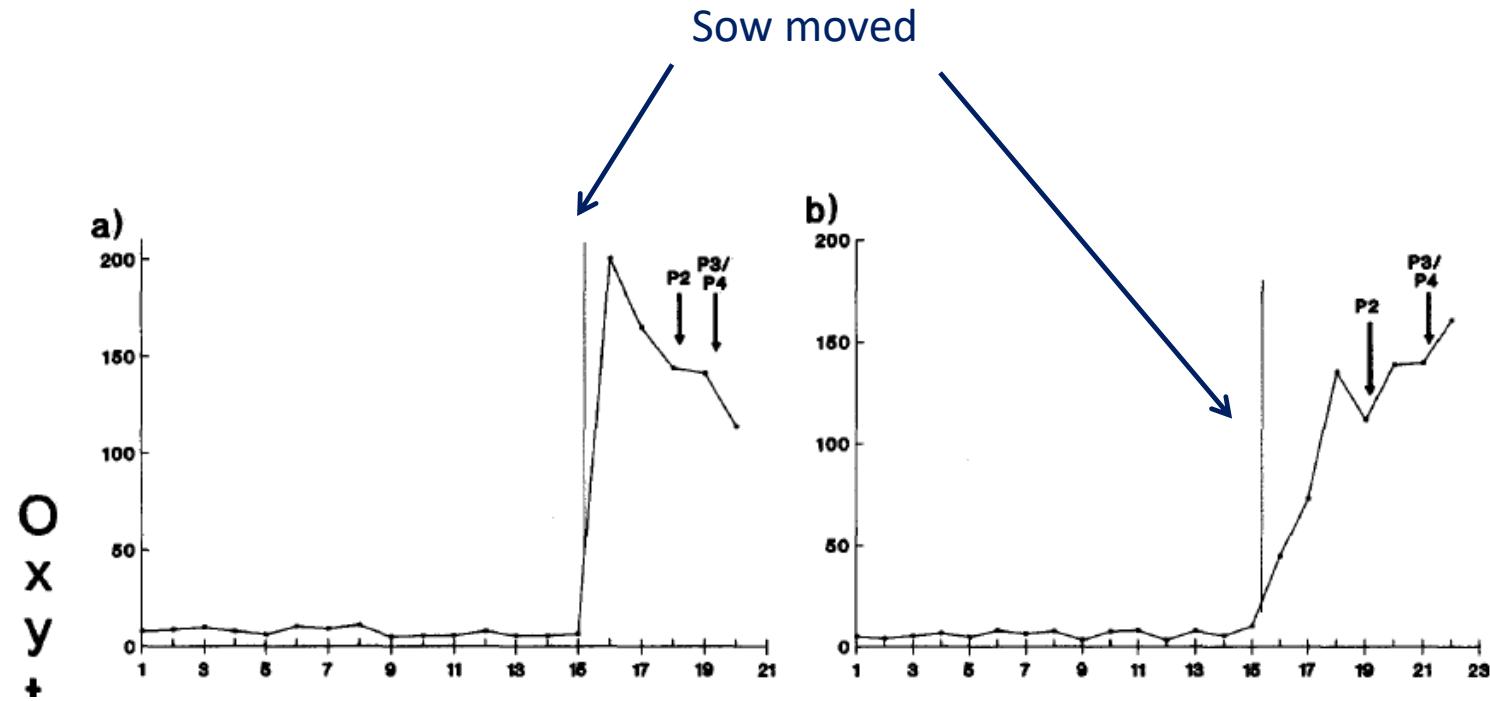
## Asphyxia affects early life performance

	Blood lactate concentration (mmol/L)				P value
	< 3.36	3.36-4.45	4.46-6.40	>6.40	
n	127	127	129	133	
Birth to first suckling (min)	34.3 ± 3.2	29.7 ± 3.2	38.8 ± 3.2	39.9 ± 3.3	0.10
Colostrum intake (g) <sup>1</sup>	463 <sup>a</sup> ± 13	441 <sup>ab</sup> ± 13	416 <sup>bc</sup> ± 13	377 <sup>c</sup> ± 13	<0.01
Weaning weight (kg)	8.47 <sup>a</sup> ± 0.13	8.41 <sup>a</sup> ± 0.13	8.13 <sup>ab</sup> ± 0.14	7.93 <sup>b</sup> ± 0.14	0.02
ADG after weaning (g/day)	721 <sup>b</sup> ± 15	710 <sup>b</sup> ± 14	717 <sup>b</sup> ± 14	664 <sup>a</sup> ± 14	0.02

# Asphyxia increases neonatal mortality







Disturbing farrowing sows inhibits OT and birth process

Lawrence et al, 1992

Farrowing in crates can reduce oxytocin secretion and delay farrowing

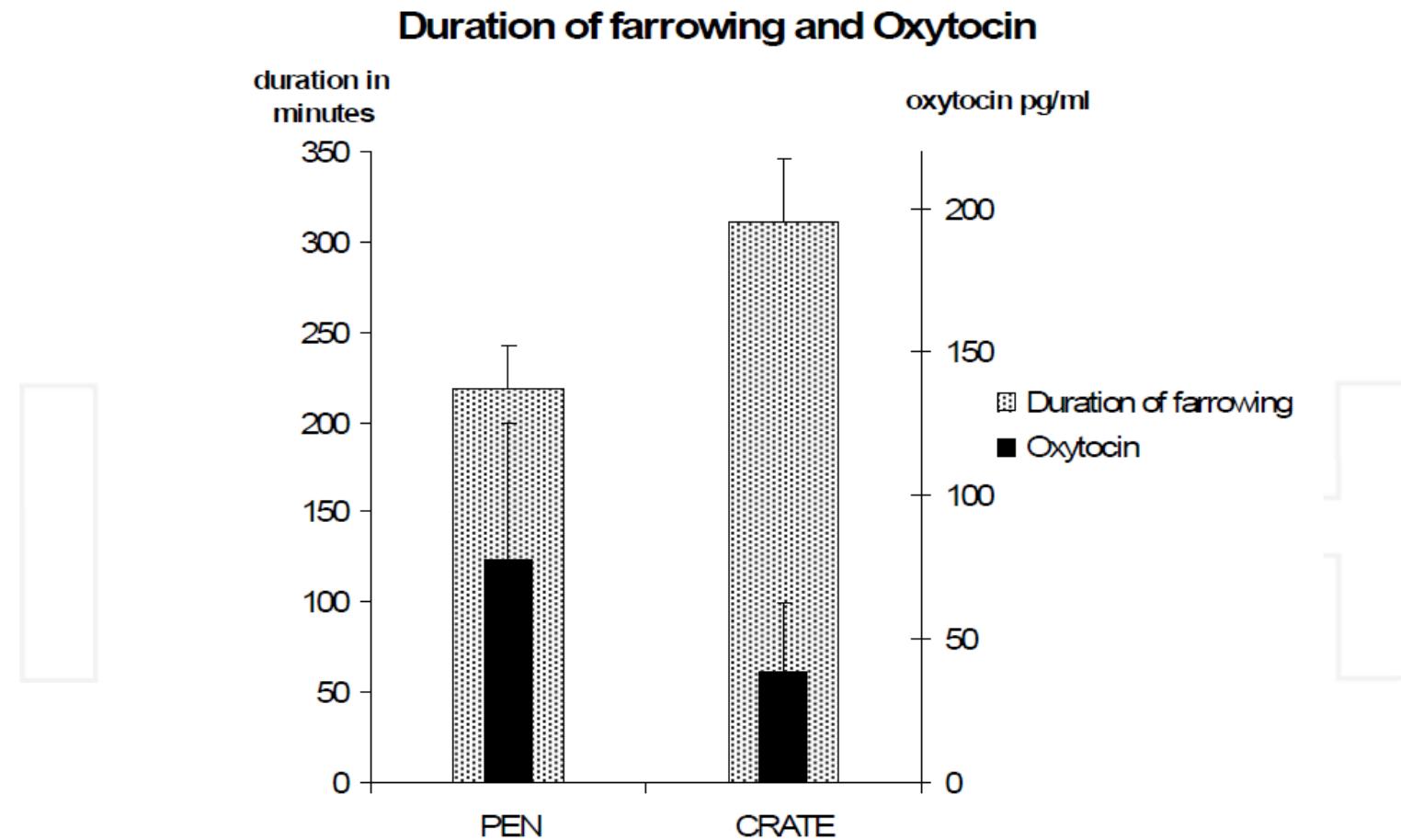


Fig. 4. Average duration of farrowing and average Oxytocin post-expulsion pulses in the PEN ( $n = 9$ ) and CRATE ( $n = 9$ ) groups of sows (mean  $\pm$  SD). Data from Oliveira et al., 2008.

## Total duration of farrowing is more relevant than interval between piglets

Impact of time since previous piglet on stillbirth				
Time	0 to 30 min	30 to 60 min	60-90 min	> 90 min
n	2978	539	162	245
% stillborn	5.6 %	6.8 %	7.4 %	18 %*

\*different from first value

Impact of total duration of farrowing on stillbirth				
Time	< 2 h	2 to 4 h	4 to 6 h	> 8 h
n	1827	1226	535	164
% stillborn	2.7 %*	6.9 %*	10.7 %*	13.4 %*

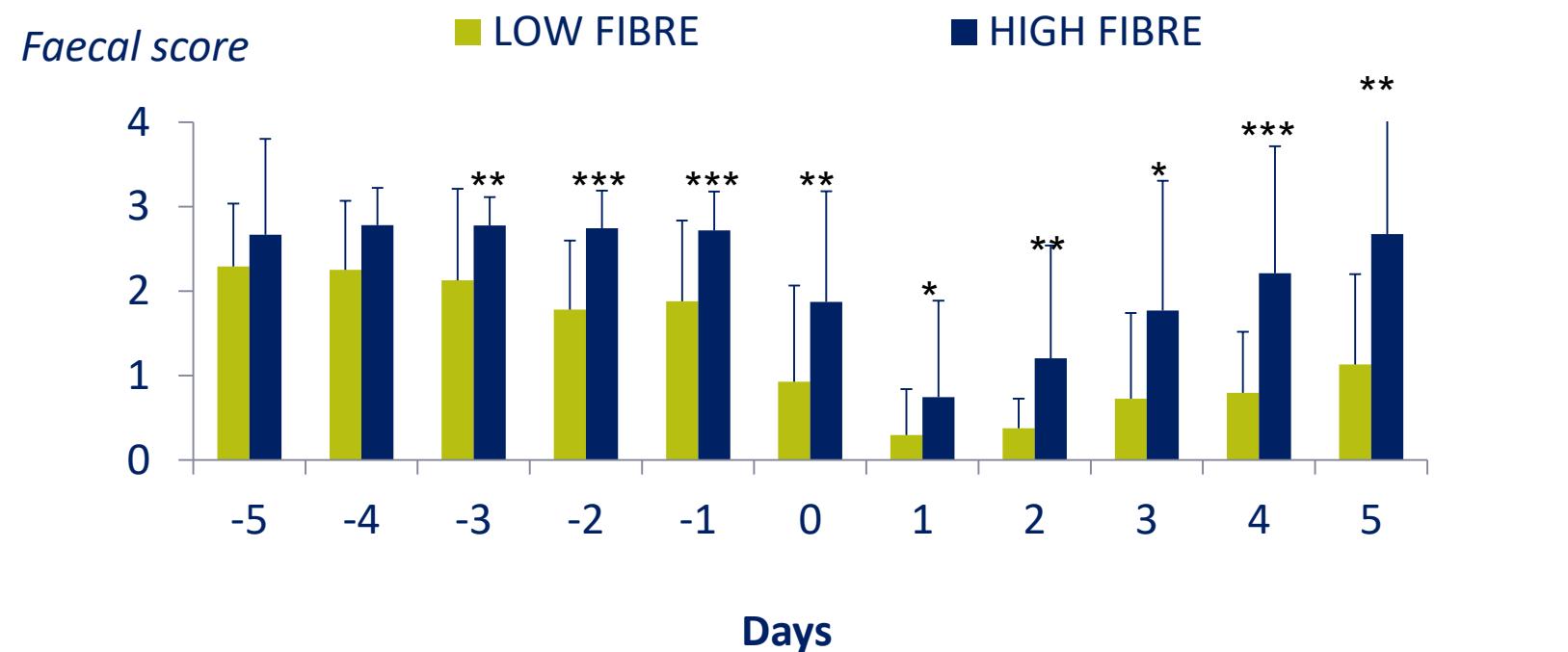
Sow faeces from several diets



Hard  
faeces

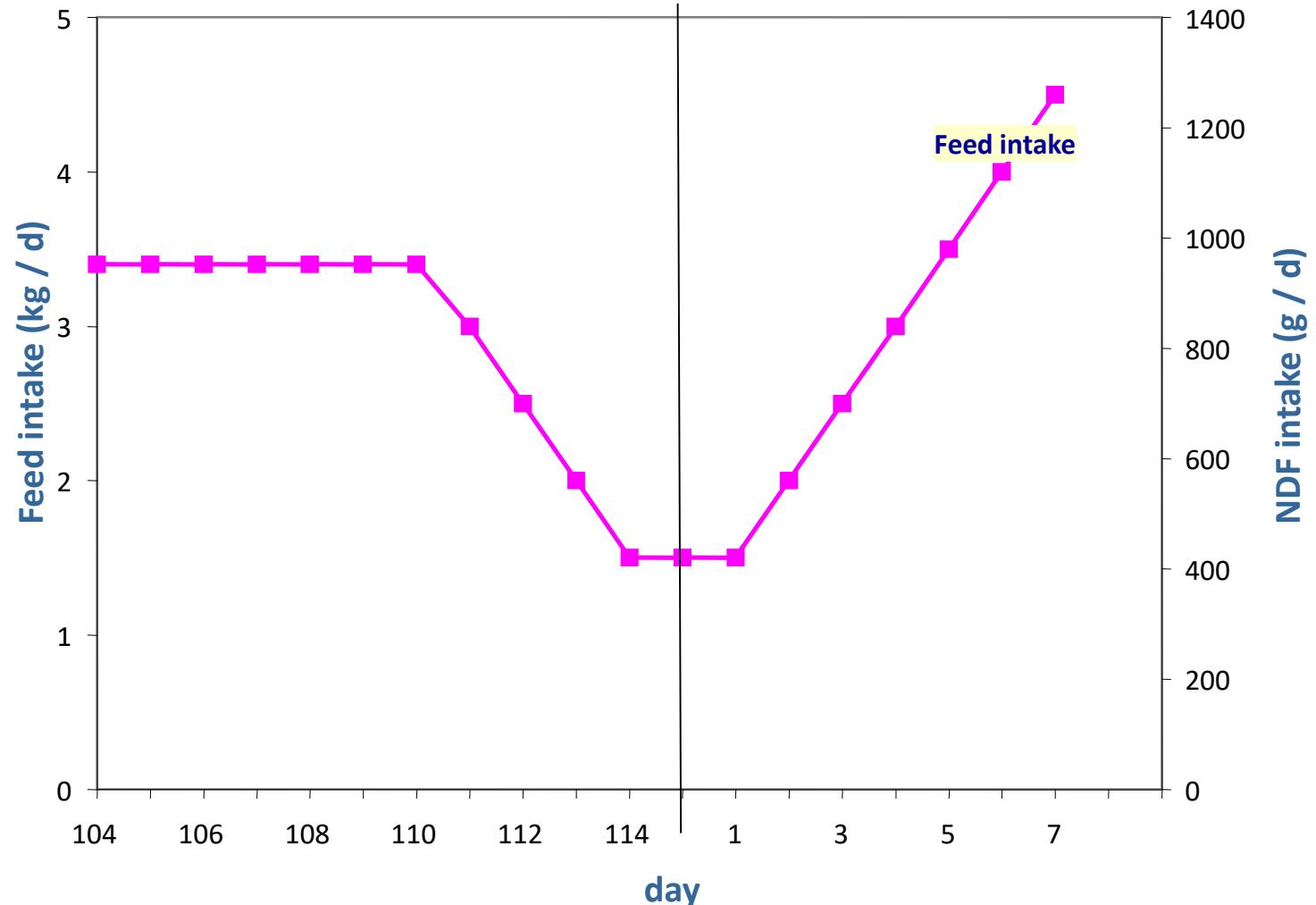


## Fibrous diets increase water intake and reduce constipation (n=250)



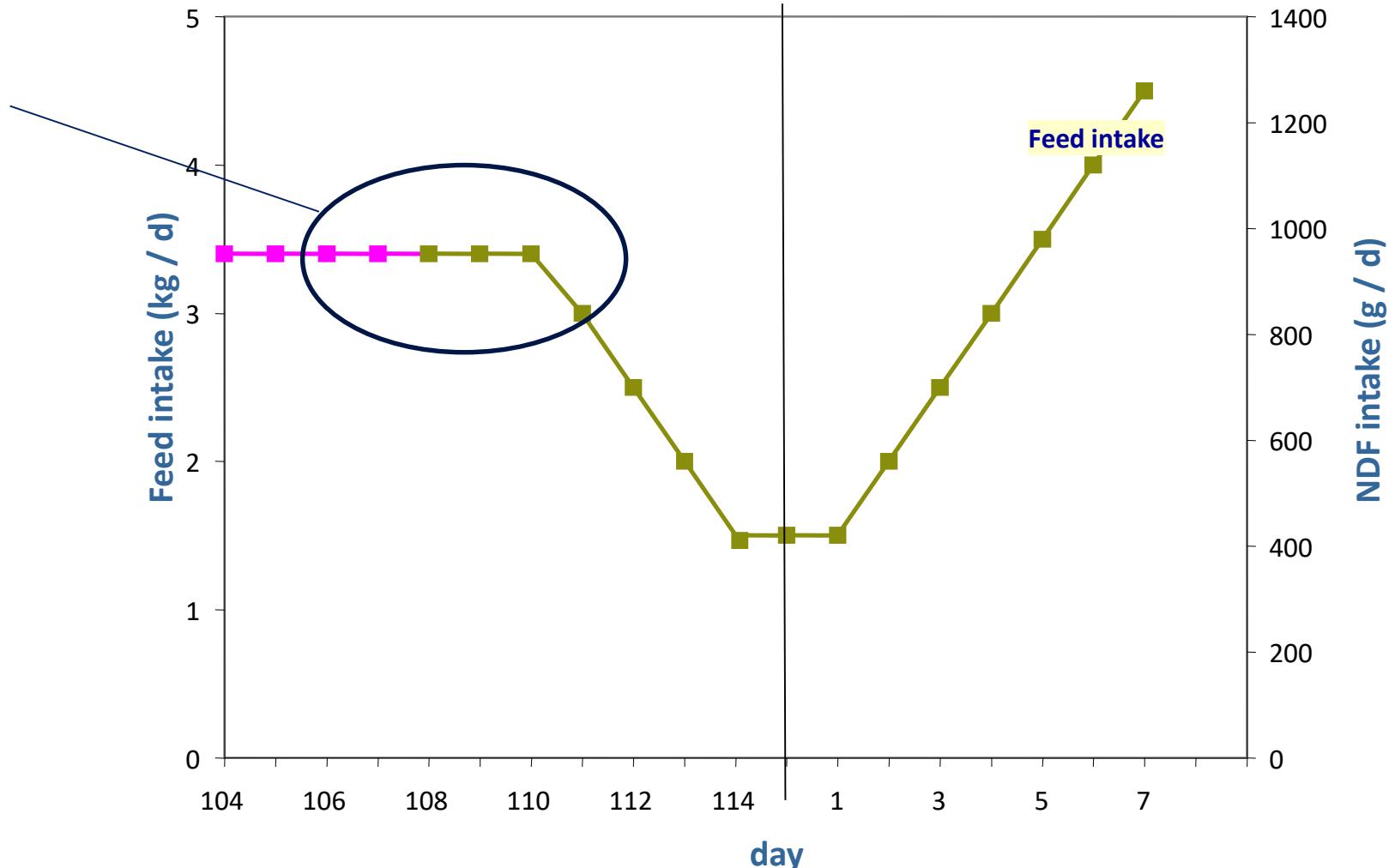
Oliviero, 2008

# Gut health is prevention of constipation

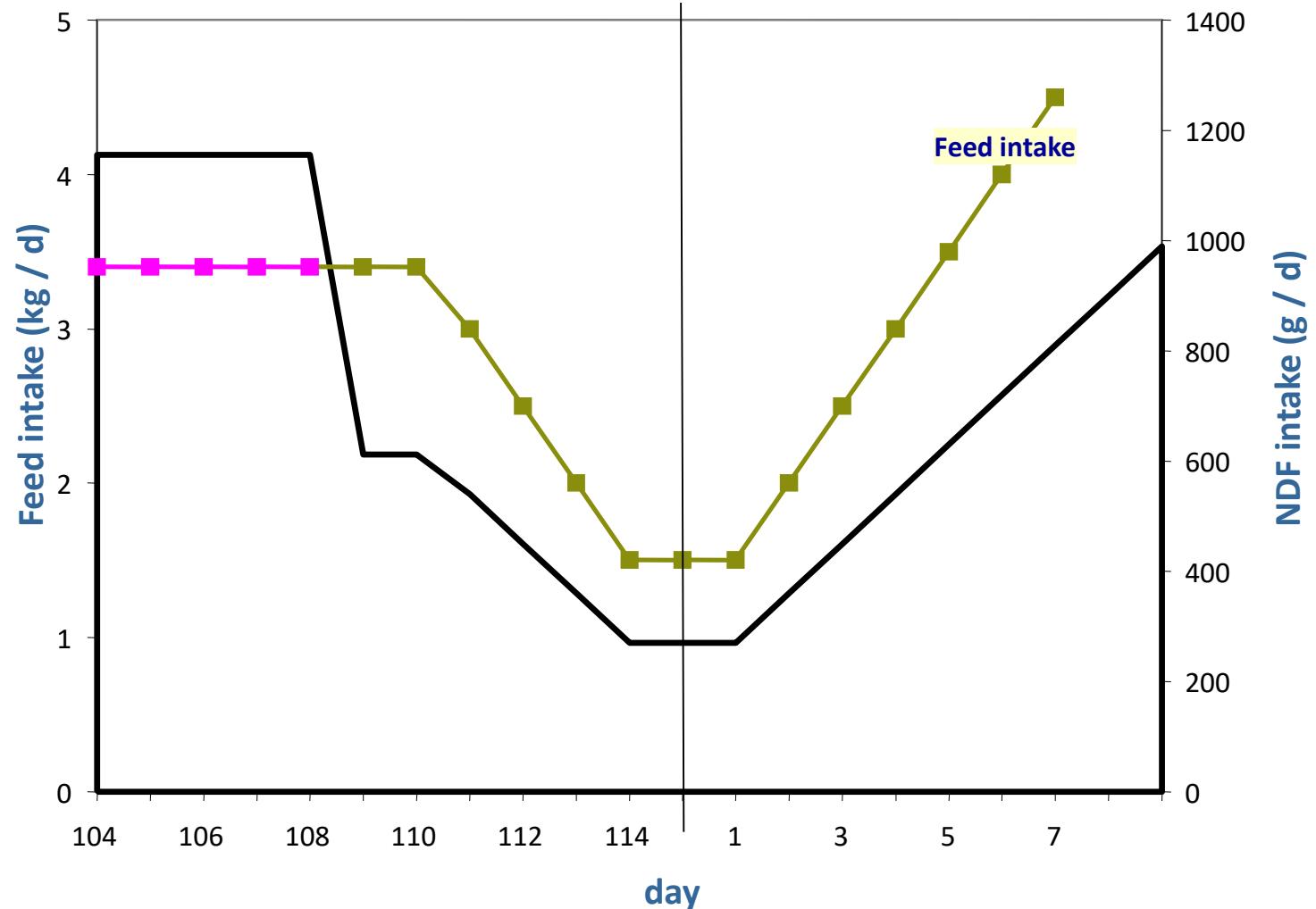


# Gut health is prevention of constipation

Change from  
high fibre to  
low fibre diet



# Gut health is prevention of constipation



## A fibrous diet can reduce constipation and the duration of farrowing

		Starch rich diet	Fibre and fat rich diet	P value
Parity number	#	2.5	2.5	
Incidence of hard faeces	%	4.9	2.4	<0.01
Farrow duration	h	6.2	5.6	0.04
Small Piglets (< 900 g)				
Colostrum intake	g	96	152	0.03

# Sow condition affects farrowing duration

**Skinny sows higher risk  
of stillbirths**

*Van der Haeghe et al., 2010*

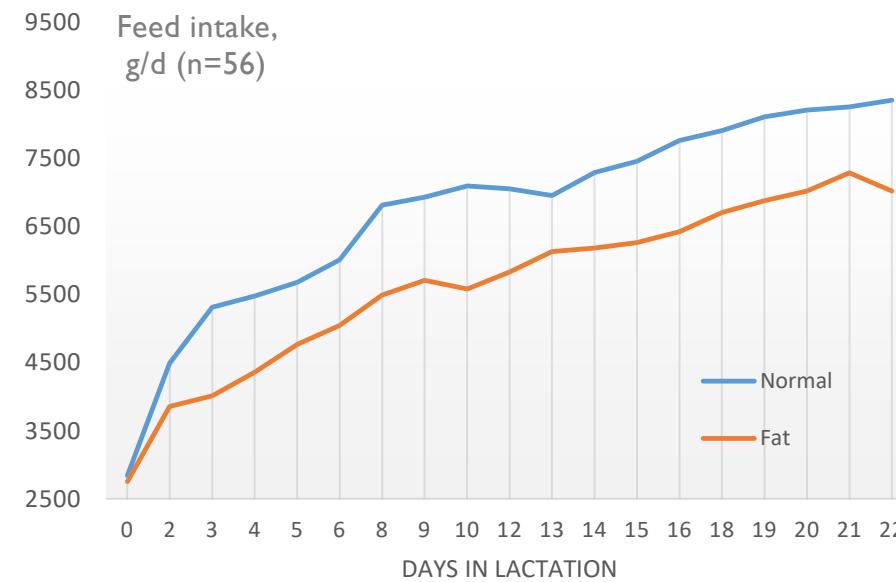
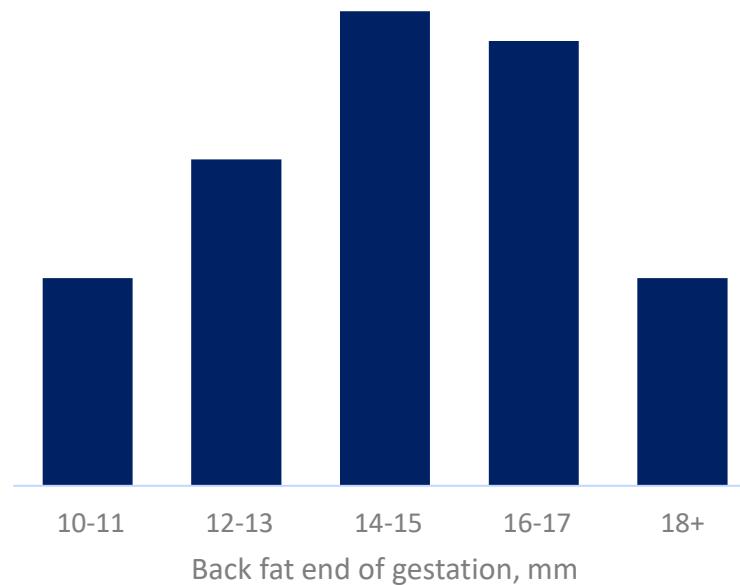


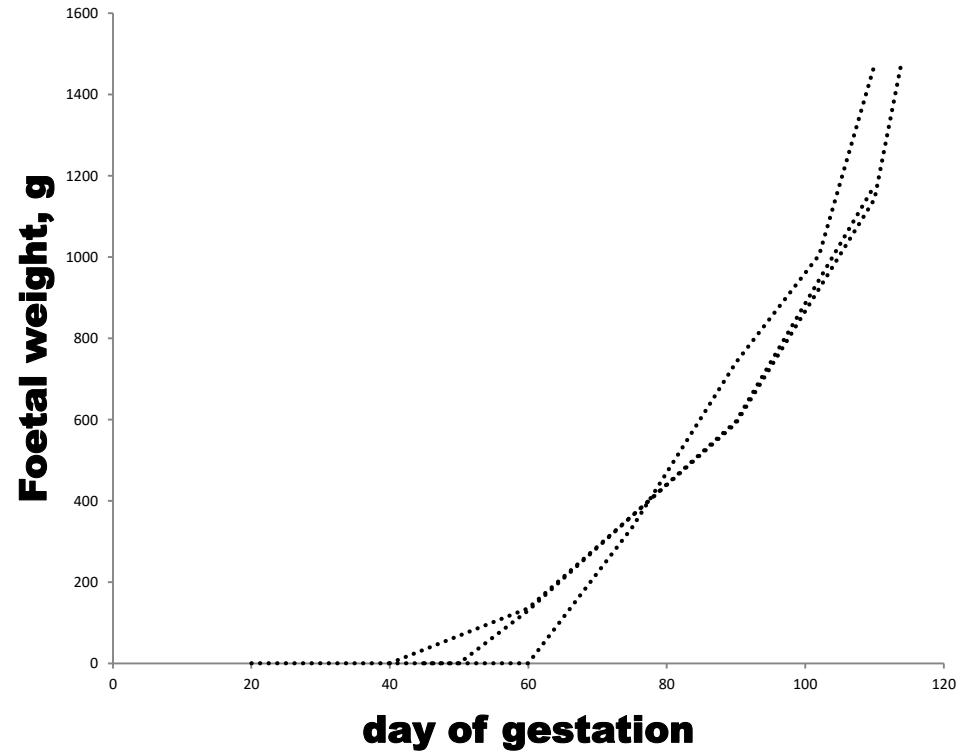
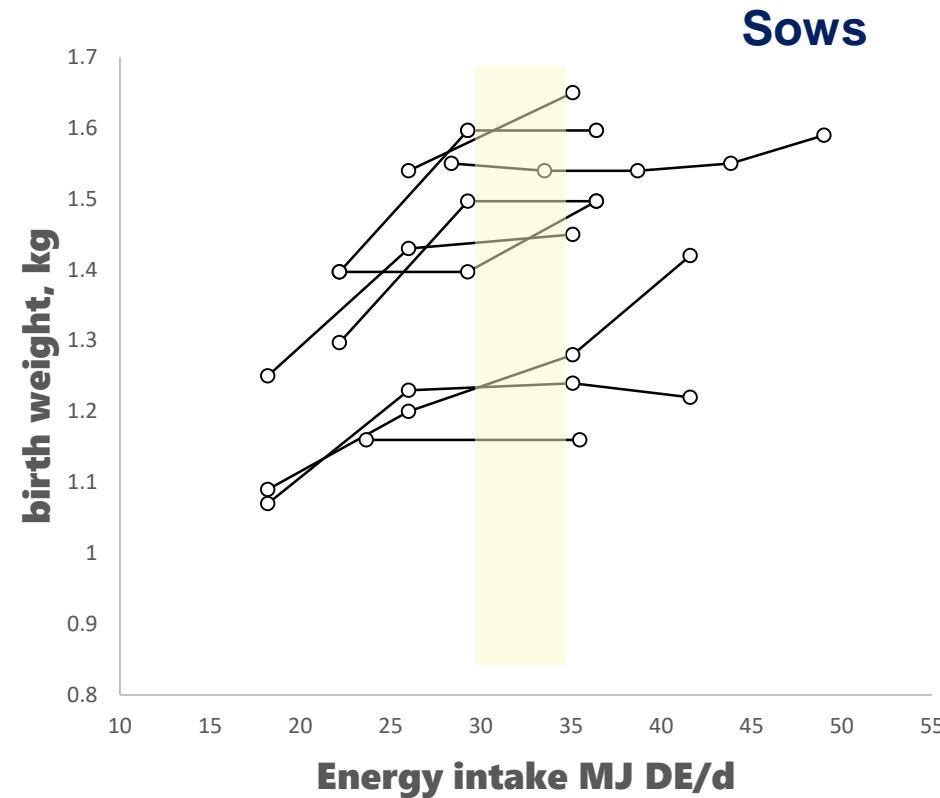
**Excessive backfat increases risk  
of prolonged farrowing**

*Oliveiro et al., 2010*

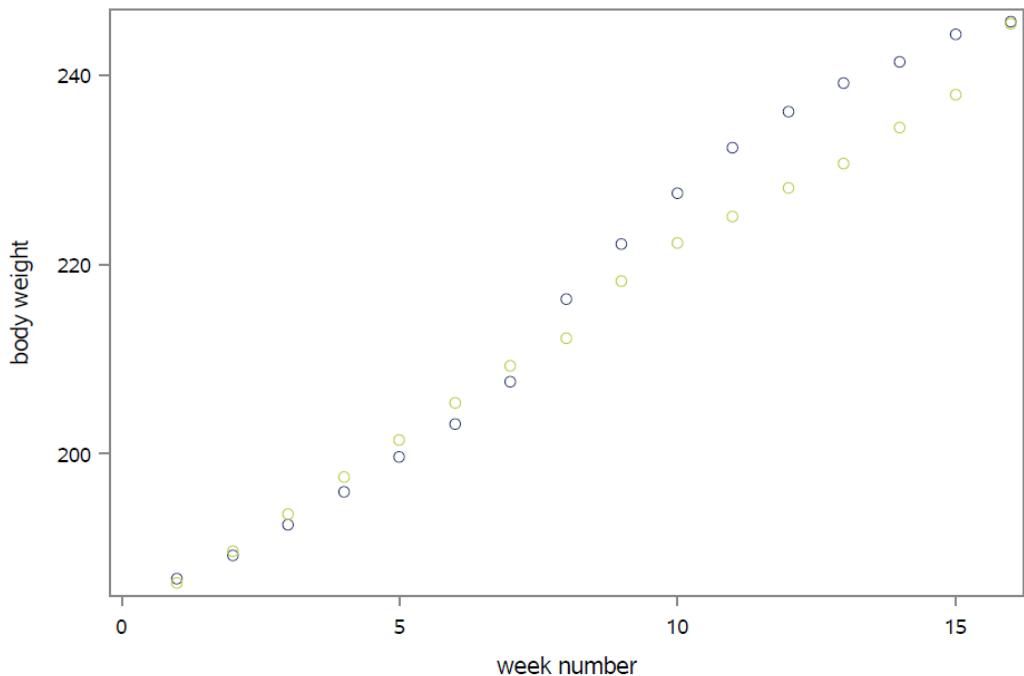
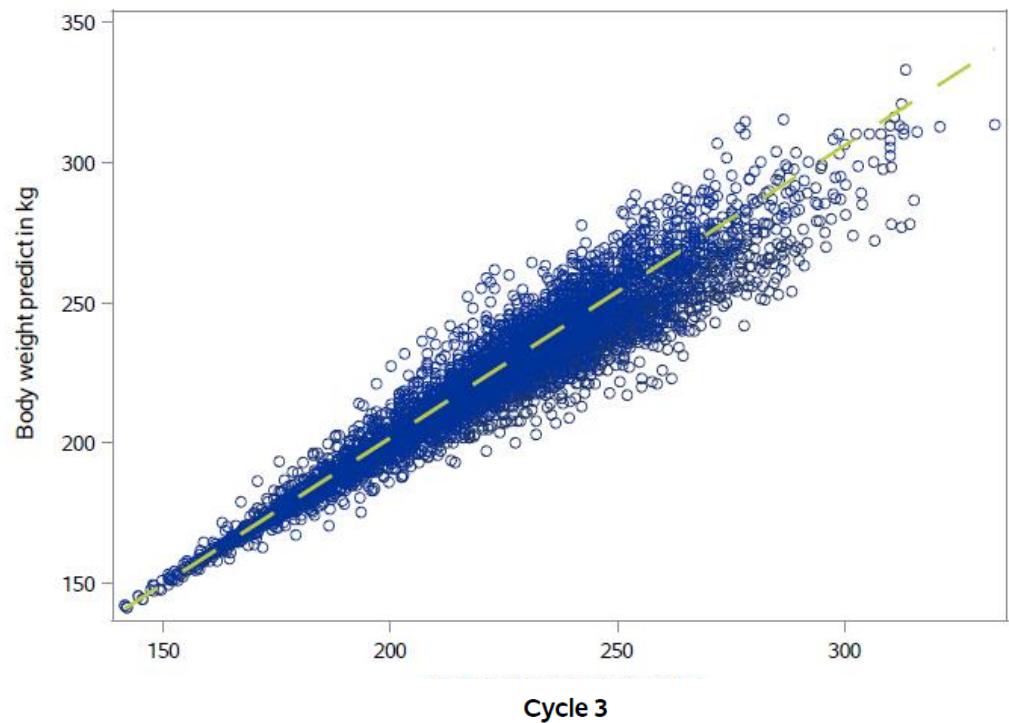
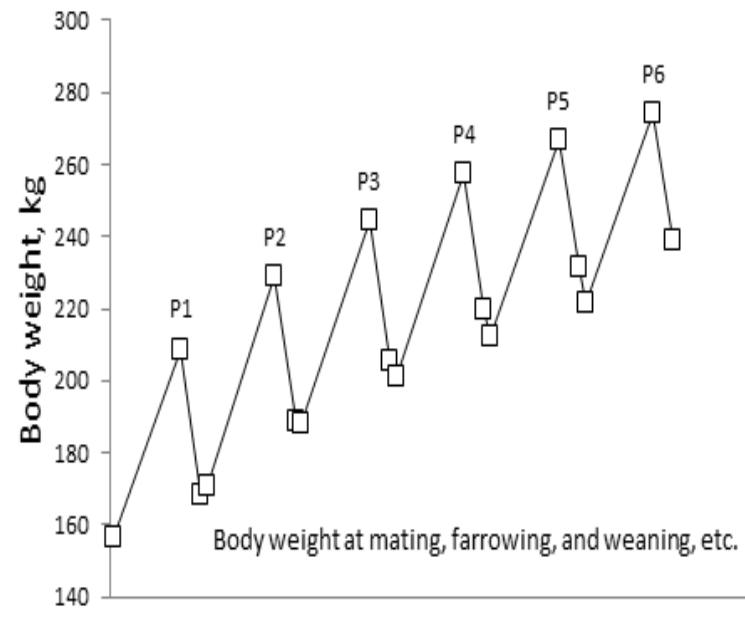


# Even in modern genotypes, back fat influences feed intake





Langendijk (2017)  
unpublished



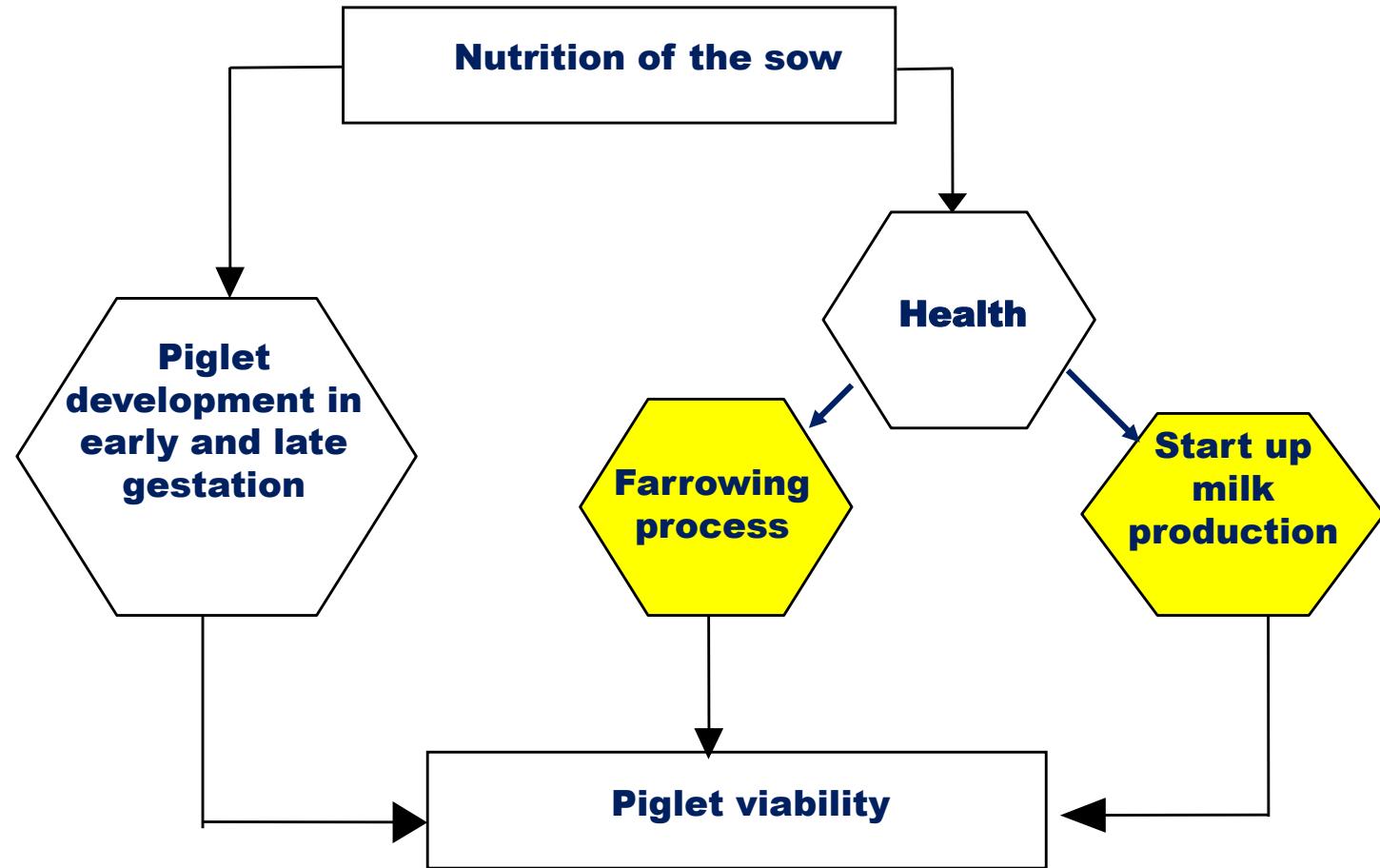
Trouw Nutrition Sow Model

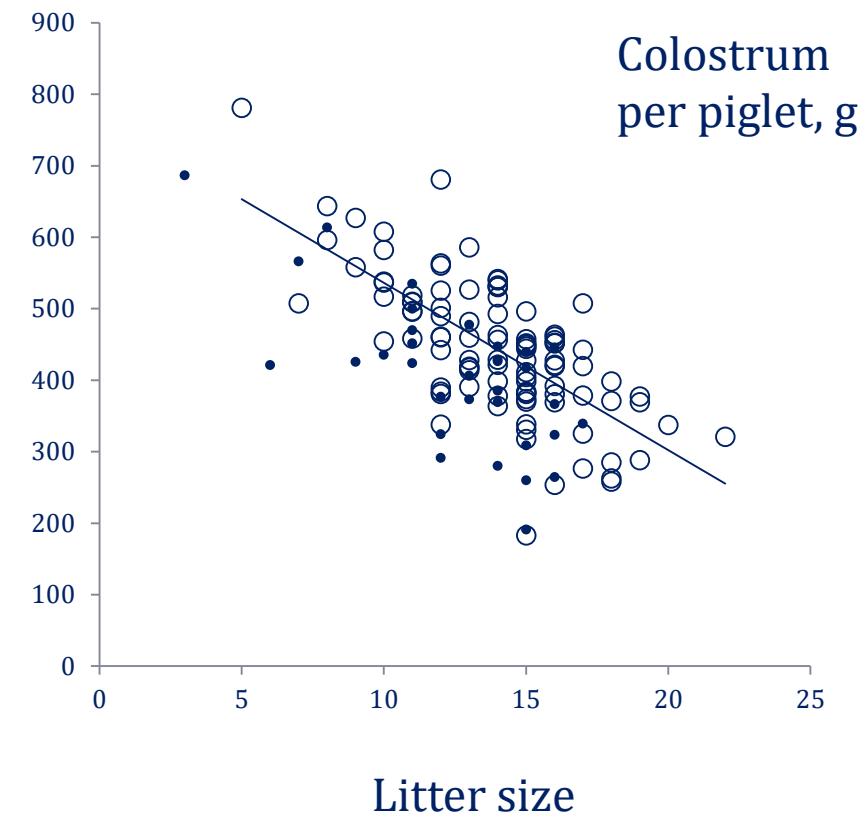
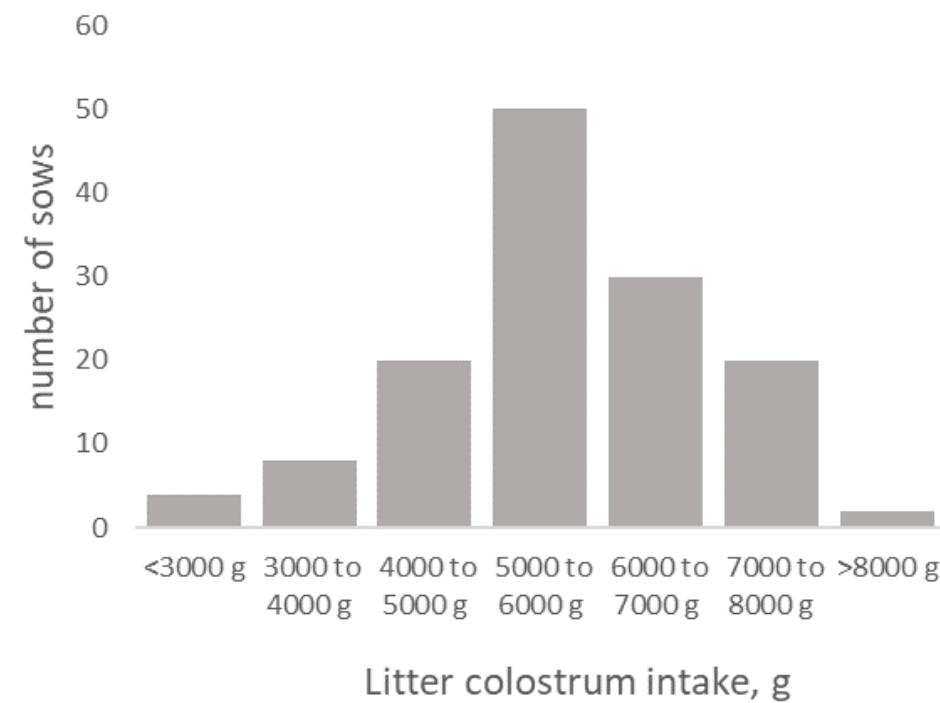
# Take home messages part 1

**Stillborn piglets are potentially viable piglets  
They die because of things that go wrong during the farrowing process**

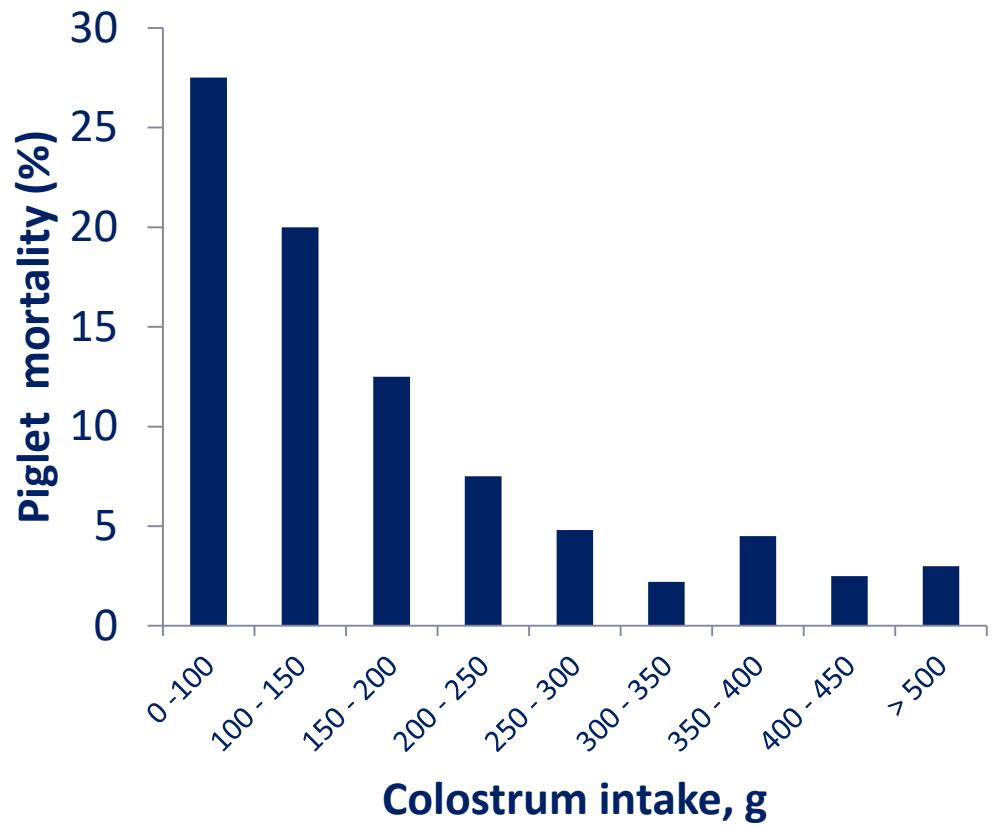
## **Management/Nutritional measures to reduce stillbirth**

- **Fibres/intake pre-farrowing**
- **Constipation/Water intake**
- **Condition of the sow**
- **Monitor – don't disturb**
- **Condition of sows**
- ...
- **Management**

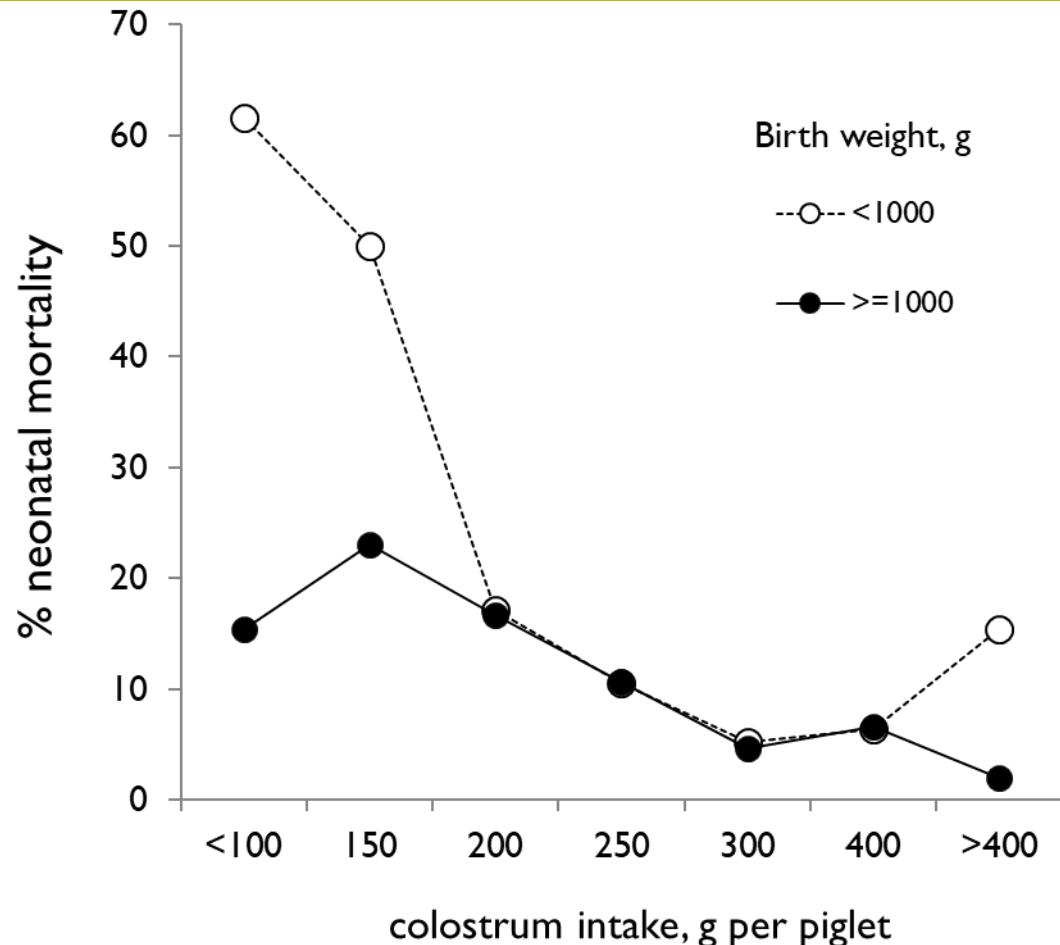




# Colostrum intake and survival

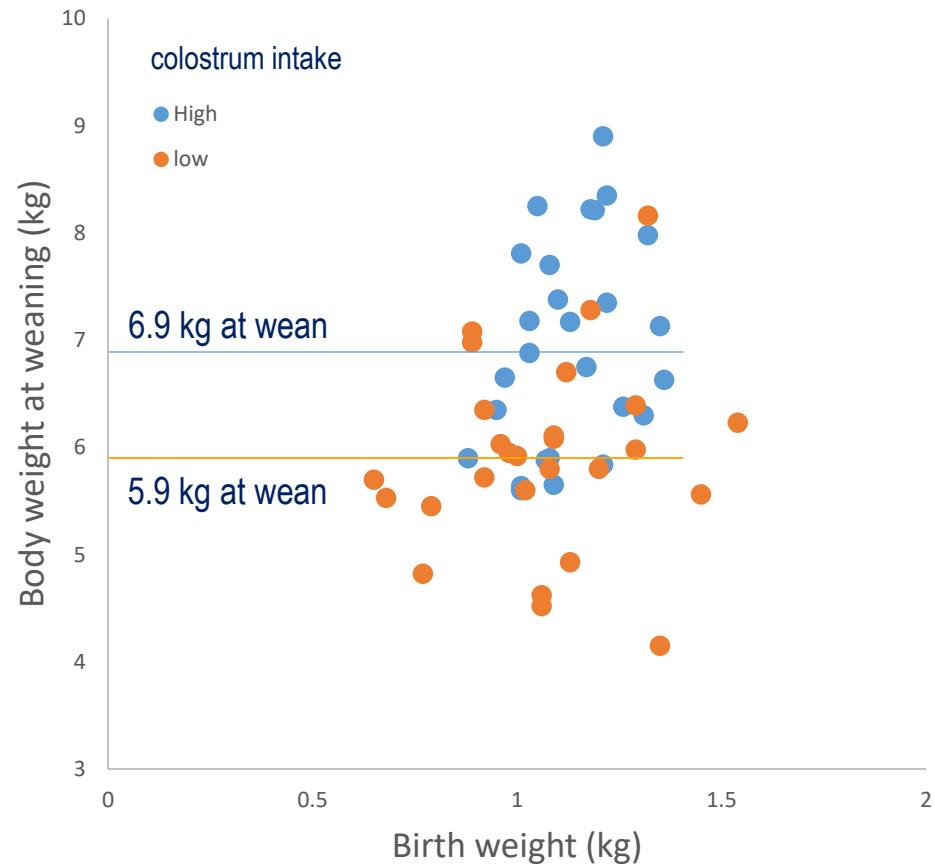


Ferrari et al., 2014

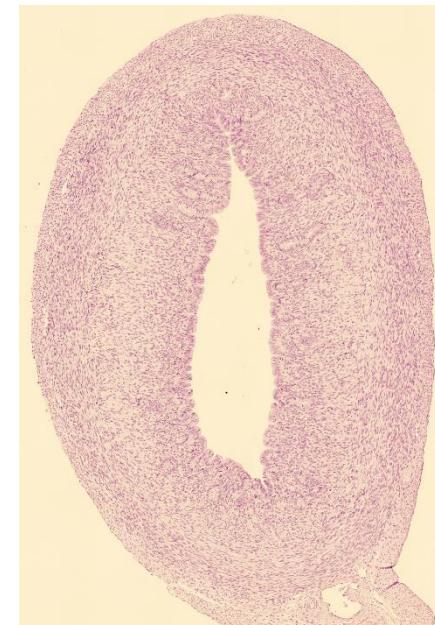


Swine Research Centre, 2017

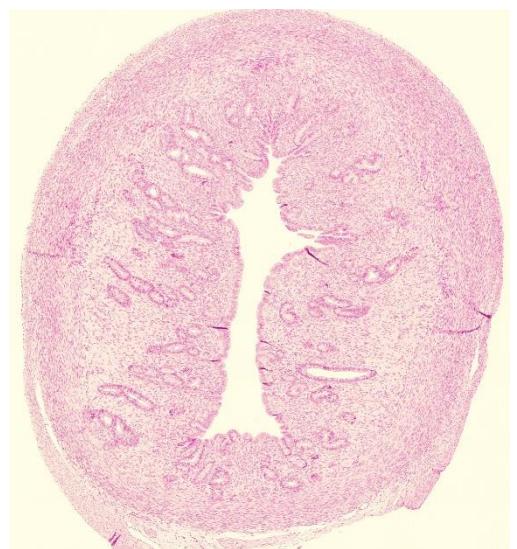
# Impact of colostrum on piglet development



Two piglets of ~1 kg from the same litter selected at birth, one with low (ave 226 g) and one with high (ave 400 g) colostrum intake.



Low colostrum intake



High colostrum intake

## Colostrum yield and prepartum feed level (from d108)

	Feed allowance		SEM
	4.5 kg/d	1.5 kg/d	
Total colostrum, g per sow	3999 <sup>x</sup>	3508 <sup>y</sup>	141
g per piglet	312	287	17
g per kg piglet	239 <sup>a</sup>	200 <sup>b</sup>	9

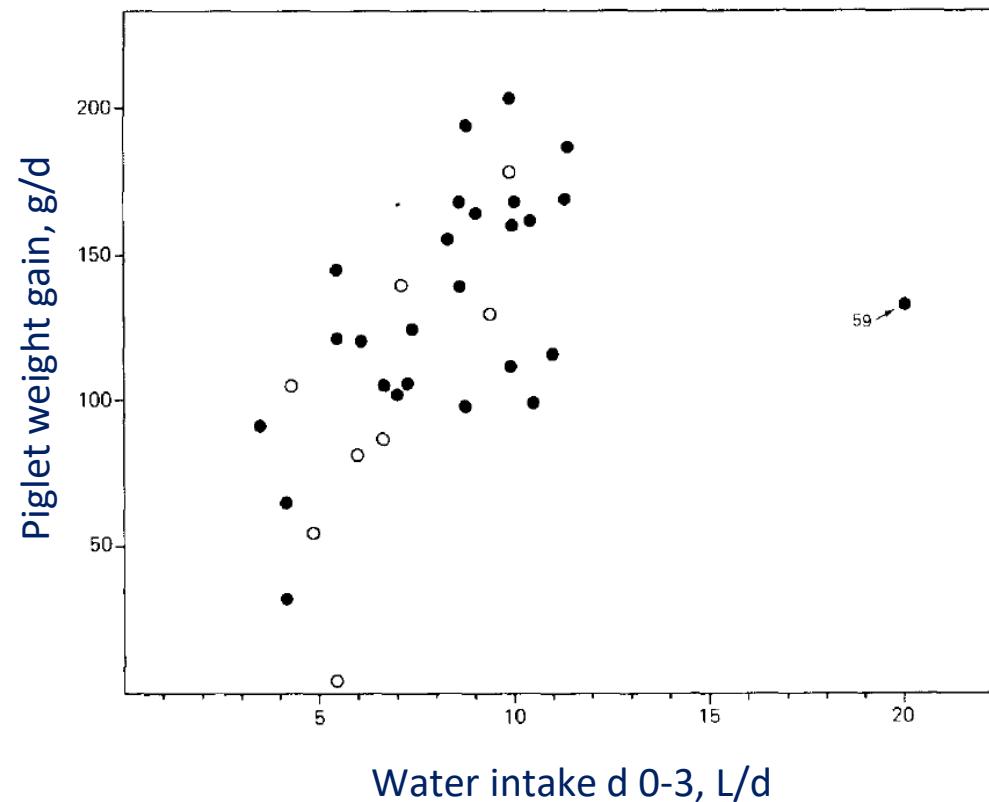
*DeCaluwe et al., 2014*

## Colostrum yield and prepartum feed level (from d108)

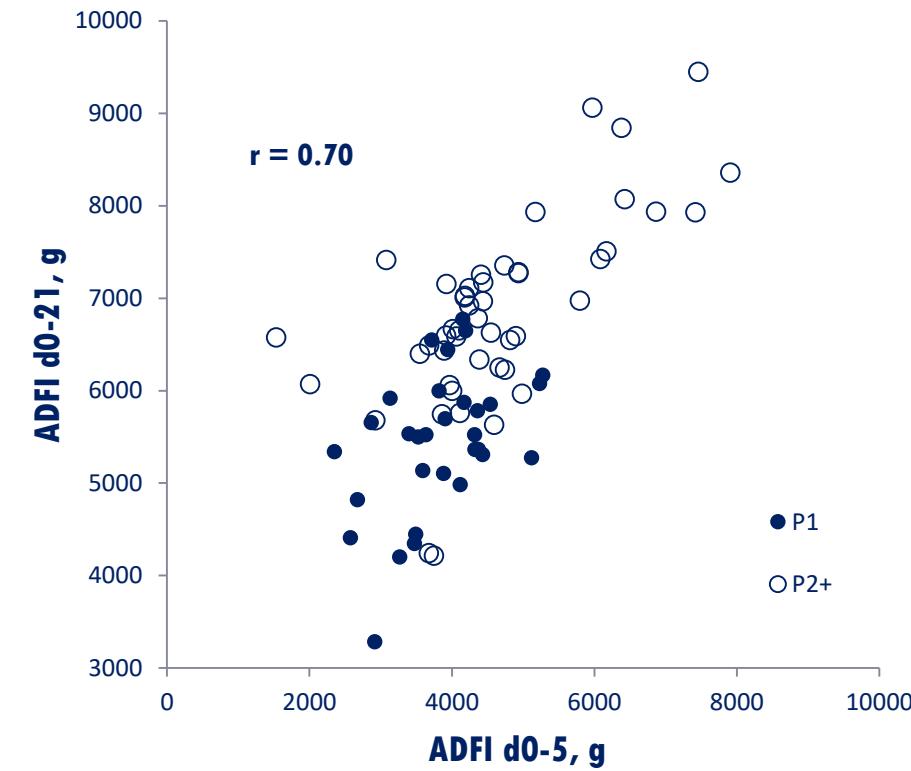
		Body condition			SEM
		Skinny	Moderate	Fat	
Total colostrum, g per sow		3874 <sup>a,b</sup>	3991 <sup>a</sup>	3163 <sup>b</sup>	141
g per piglet		297 <sup>a,b</sup>	345 <sup>a</sup>	230 <sup>b</sup>	17
g per kg piglet		215 <sup>a,b</sup>	245 <sup>a</sup>	178 <sup>b</sup>	9

DeCaluwe et al., 2014

## Good start of lactation: feed and water intake !



Fraser and Philips, 1989



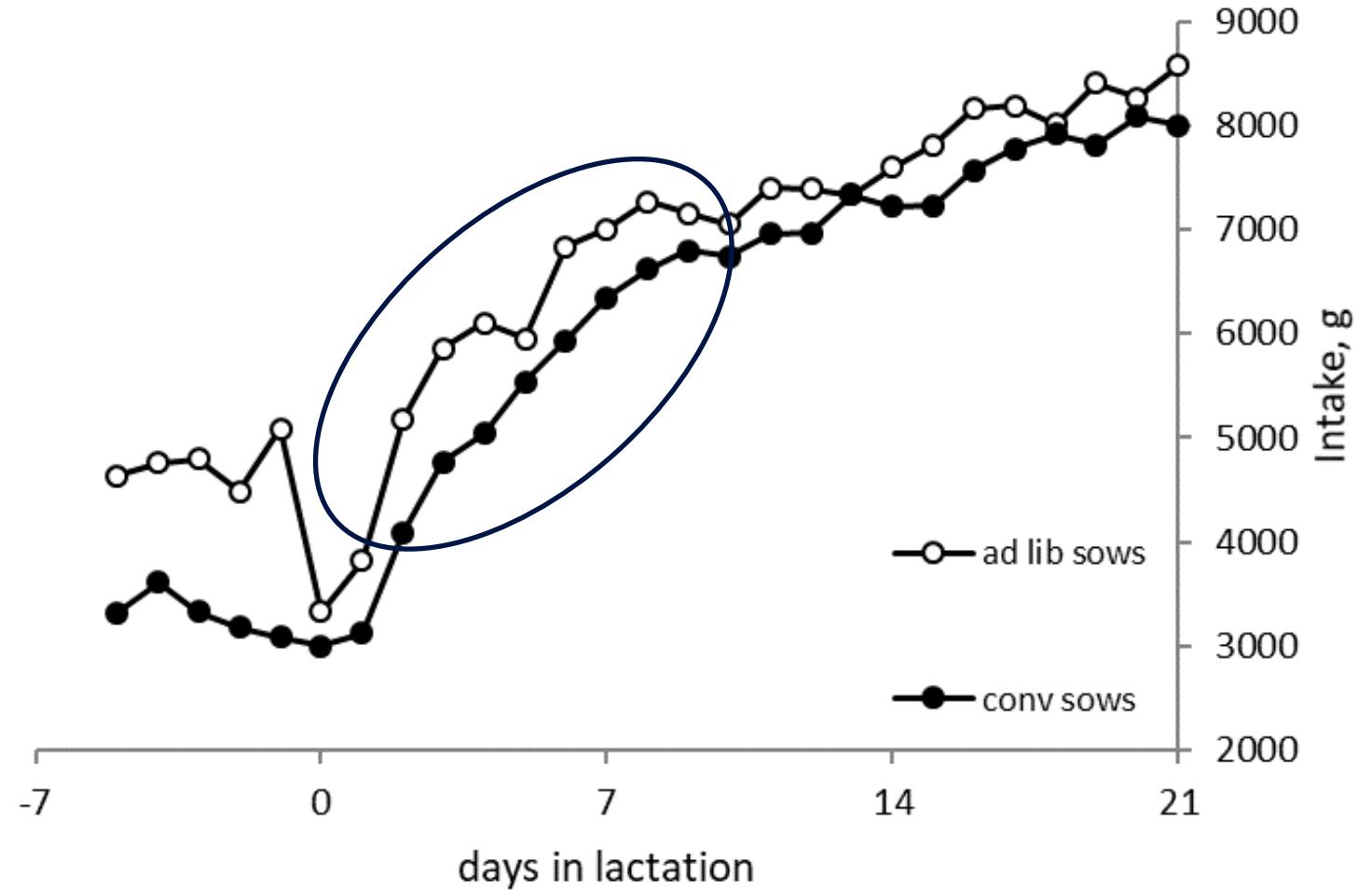
Swine Research Centre, 2015

# Feed intake in transition and lactating sows



Real time feed intake monitoring

## Ad lib vs conventional feeding in transition



# Ad lib transition feeding improves performance of piglets

Variable	Primiparous sows		Multiparous sows	
	Ad lib (n=17)	Conventional (n=16)	Ad lib (n=23)	Conventional (n=25)
Birth weight, g	1305 ± 52	1335 ± 49	1381 ± 47	1406 ± 48
Litter size at start of lactation	12.9 ± 0.4	12.9 ± 0.4	14.8 ± 0.6	15.0 ± 0.6
Weaning age	24 ± 0.5	24 ± 0.4	25 ± 0.4	25 ± 0.4
# weaned	11.6 ± 0.3	12.0 ± 0.3	12.7 ± 0.3	12.8 ± 0.4
Weaning weight, kg	6.27 ± 0.19	6.52 ± 0.20	<b>7.62 ± 0.21<sup>a</sup></b>	<b>7.10 ± 0.14<sup>b</sup></b>
ADG to wean, g/d*	208 ± 7	218 ± 8	<b>247 ± 6<sup>a</sup></b>	<b>231 ± 4<sup>b</sup></b>
Litter gain, kg*	73.3 ± 2.5	75.9 ± 2.6	<b>97.0 ± 2.3<sup>a</sup></b>	<b>90.2 ± 2.2<sup>b</sup></b>
Sow body weight loss, kg	16.7 ± 3.0	17.5 ± 3.4	17.6 ± 3.2	19.8 ± 2.6

\*corrected for litter size

# Take home messages part 2

## **Nutritional measures to increase neonatal survival**

- **Maximise feed intake and minimise constipation**
- **Condition of the sow**
- **Ad lib feeding**
- **Fibres**
- **Water intake**
- **...**
- **Management**

# Thank you