Effects of mean weight of uniform litters on sows and piglets performance

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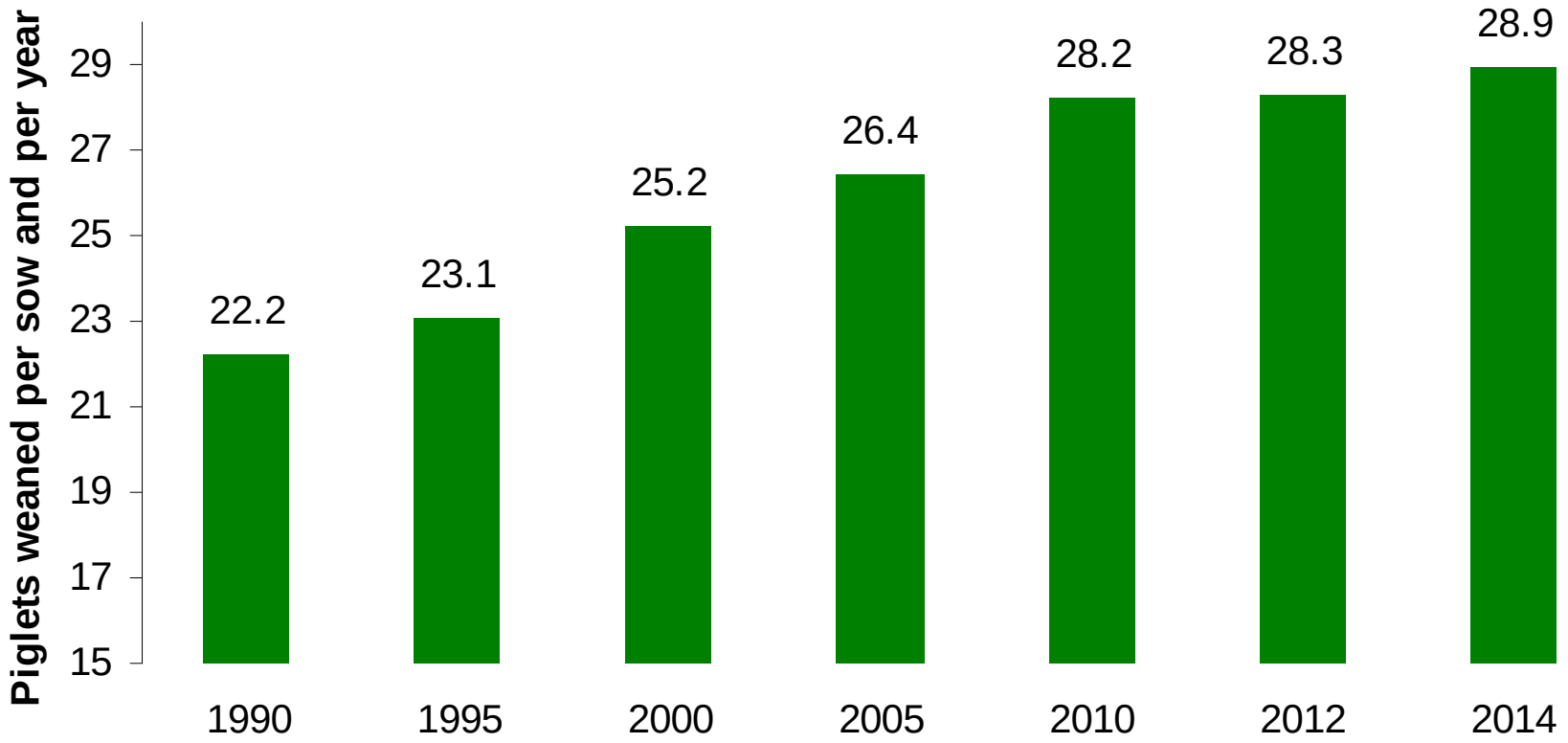
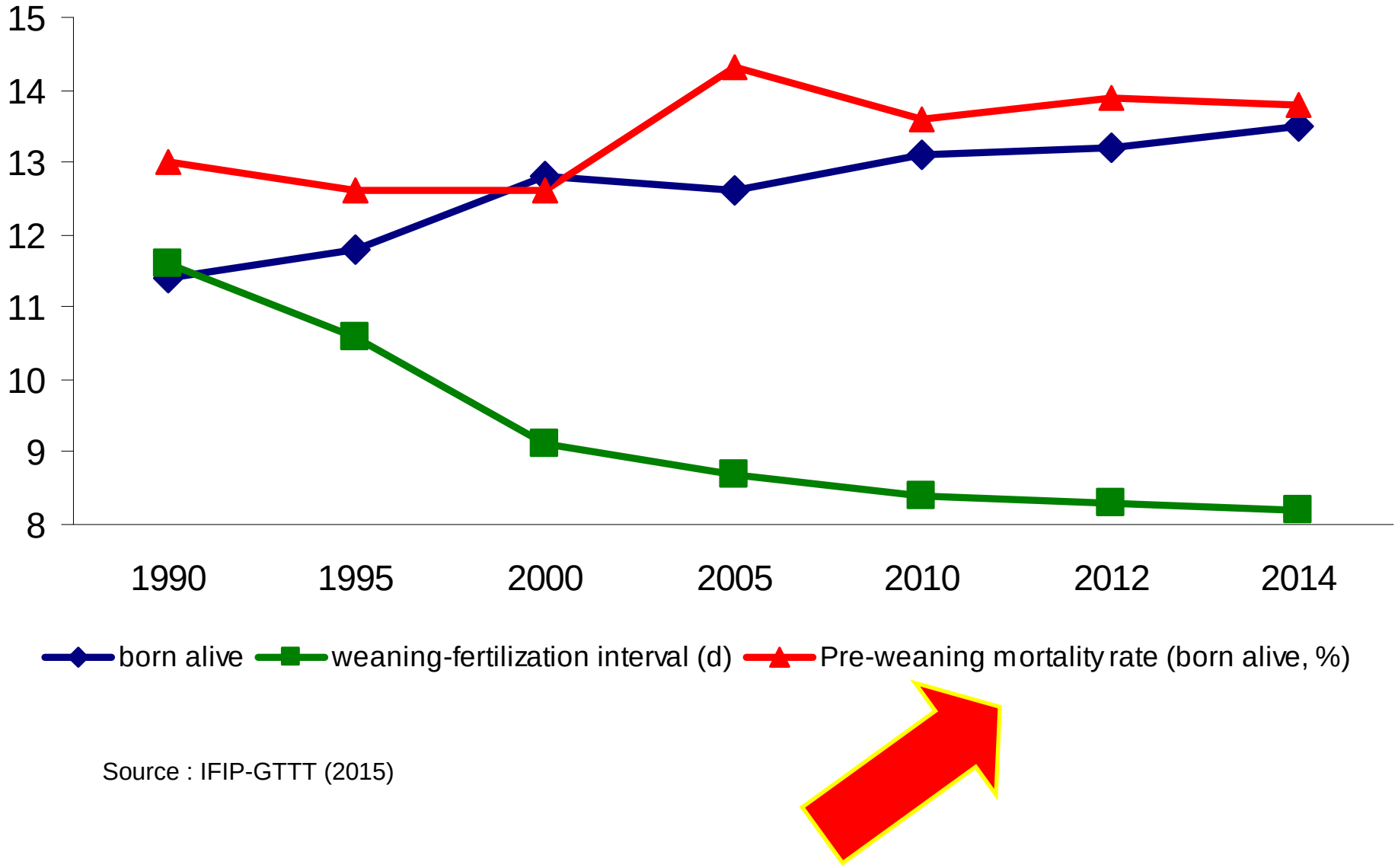
INTRODUCTION



Source : IFIP-GTTT (2015)

INTRODUCTION



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INTRODUCTION

PREWEANING MORTALITY OF PIGLETS

Concentrated in the first 2-3 days post-farrowing

Main causes

CRUSHING BY THE SOW

Accidental?

Poor mothering?

Hypothermia/Lethargy? ←

WEAKNESS

Low birth weight (runt)?

Low vitality?

No or insufficient colostrum intake? ←

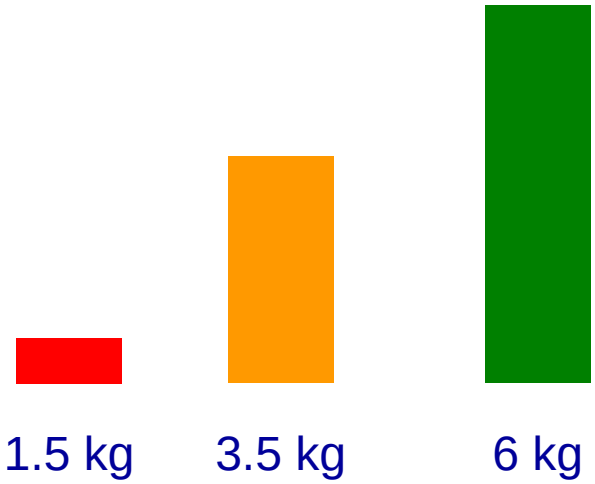
STARVATION No or insufficient colostrum/milk intake? ←

→ **Importance of colostrum intake**

INTRODUCTION

Colostrum intake to “survive” (Quesnel *et al*., 2012)

Colostrum Yield by the sows



35% SOWS

INSUFFICIENT

PRODUCTION

INTRODUCTION

INDIVIDUAL COLOSTRUM INTAKE

CV: 40%

0 – 700g

INTRODUCTION

INDIVIDUAL COLOSTRUM INTAKE

PRODUCTION BY THE SOW
+
EXTRATION CAPACITY BY THE PIGLETS

Problems/factors

Hiperprolificacy

Large Litters (>15)

1991 – 20%

2008 - > 50%

Heterogeneity

Mean CV – 20%

Can be > 50%

Light piglets

+ per litter

INTRODUCTION – previous study

Charneca *et al*. (2013).

UNIFORM (n=26)

12 piglets, CV: 9.3%

Mean weight: 1391 ± 28g

VS

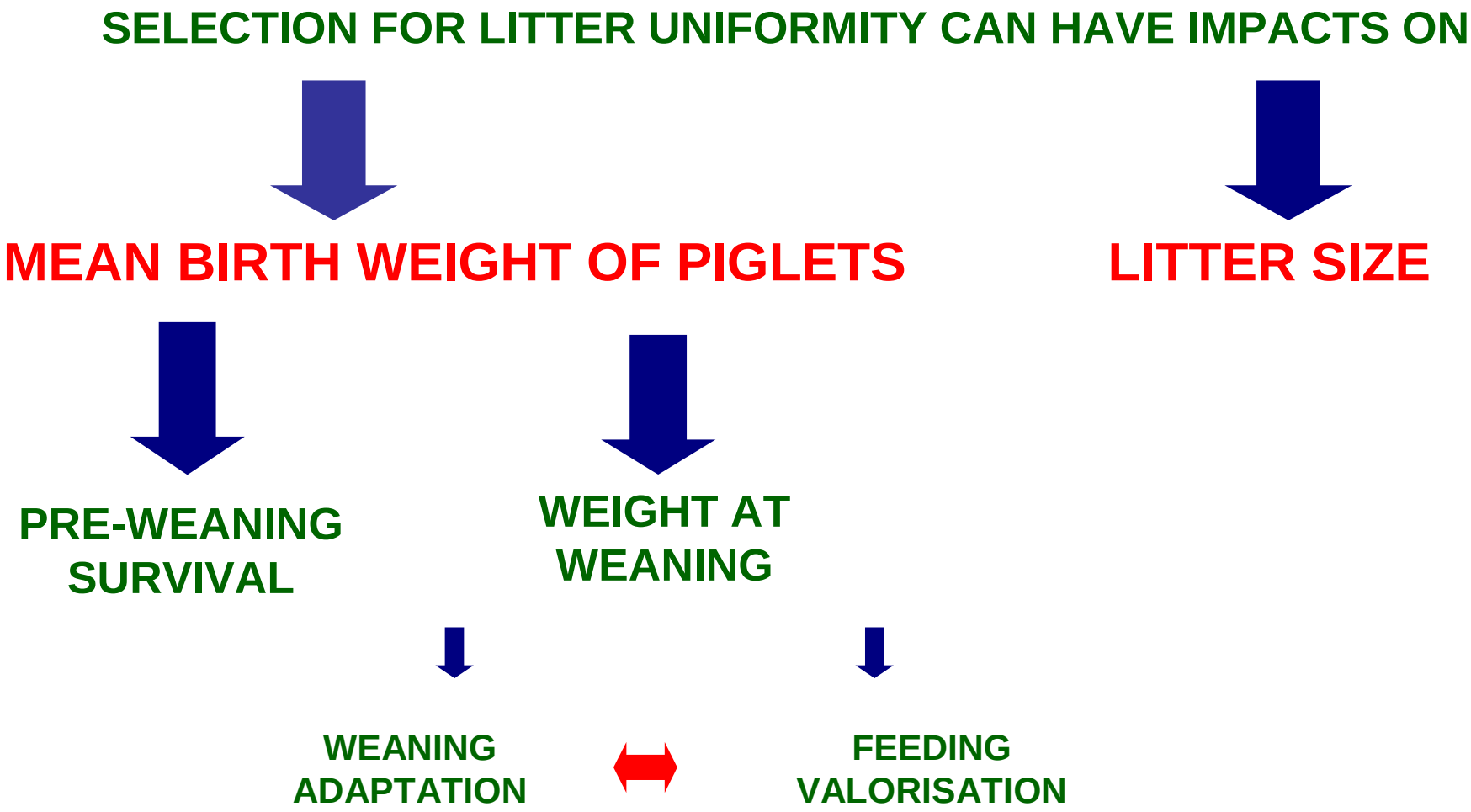
HETEROGENEOUS (n=26)

12 piglets, CV: 27.8%

Mean weight: 1393 ± 29g

- Tend to produce more colostrum
- ≈ individual colostrum intake
- variation colostrum intake (CV: 22% vs 36%, P=0.01)
- Mortality rate 0 - 21d (6.4% vs 11.9%, P=0.02)
- More uniform litters at 21d (17.1% vs 25.8%, P=0.01)

INTRODUCTION



Question: Can mean weight of uniform litters have an impact?

Objectives

Effects of uniform litters of different mean birth weights on:

Sows:

- Colostrum Yield

Piglets:

- Colostrum intake
- Survival until 21 days of age
- Growth during sucking phase
- Uniformity of litter at 21d

MATERIALS AND METHODS

FARM – FACILITIES - ANIMALS

Private intensive pig farm at south Portugal

± 1000 Large-White - Landrace type sows (Topigs 20)

Piétrain semen (Top Pi)

Group gestation

20 farrowing rooms (10 – 16 places)

3 weeks batches system (130-150 sows per batch)

Weaning on average at 26 days of age

Normal feeding and piglets management

No farrowing induction

MATERIALS AND METHODS

Experimental procedures

Simultaneous farrowing supervision

Primiparous or multiparous sows (total =78 sows)

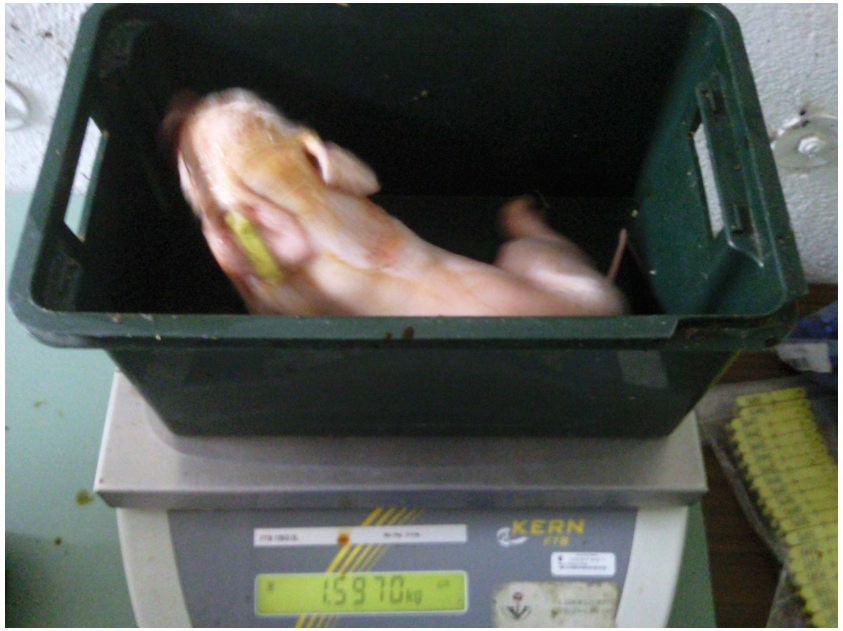
Piglets at birth:

Roughly dried

Weighed (±0.5g)

Identified (ear tag)

Placed inside a PVC box



MATERIALS AND METHODS

Experimental procedures

After the final of two simultaneous farrowings

Reweighing of the piglets

Uniform Light (UL) **Uniform Average (UA)** **Uniform Heavy (UH)**

12 Piglets

Free sucking (Time 0)

Supernumerary piglets - adopted by no experimental sows - removed from the study

MATERIALS AND METHODS

Experimental procedures

Time 0 —**24h**→ **Weighing (colostrum intake period)**

Colostrum intake (CI): Devillers et al. (2004) equation

Colostrum yield of sows: sum of individual CI

Deaths until 21 days of lactation (time, weight at death time)

Piglets were weighed at 21d of age

Statistics: Descriptive statistics for original litters; Litter types were compared by ANOVA with batch as random factor; Results: means ± SEM

RESULTS/DISCUSSION

Original litters

	Mean	Minimum	Maximum
Parity	4	2	8
Farrowing duration (min)	232	102	430
Total Born	14.2	6	21
Born Alive	13.2	5	18
Stillborn	0.8	0	6
Mummified	0.2	0	3
Mean birth weight (g)*	1414	940	2193
Intra-litter CV (%)*	19.0	3.4	36.4

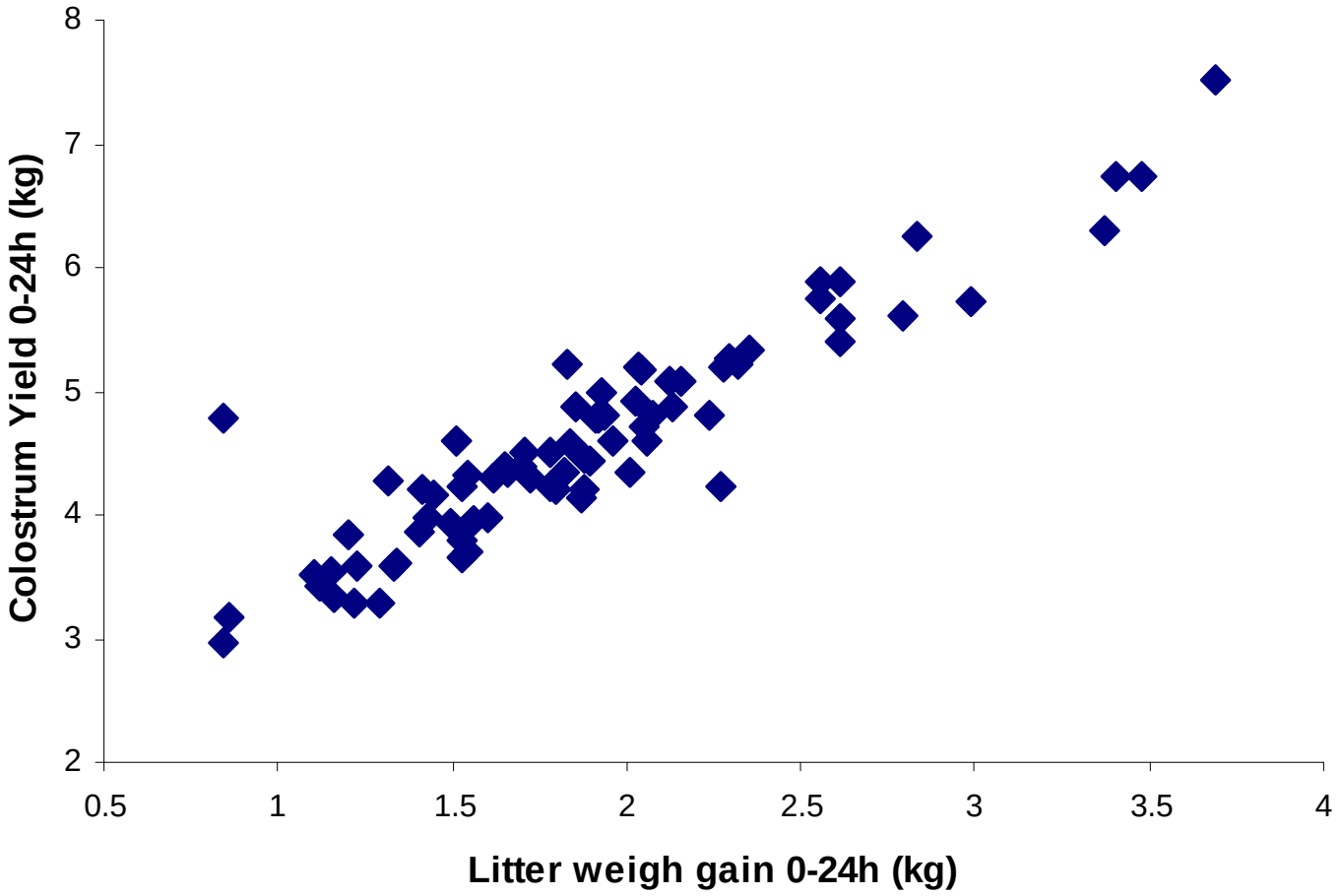
* Only alive born piglets

RESULTS/DISCUSSION

Experimental litters - sows

	Uniform light (UL)	Uniform Average (UA)	Uniform Heavy (UH)	*P*-value
n	**27**	**23**	**28**	**-**
Intra-litter CV (%)	**9.8 ± 0.4**	**8.2 ± 0.5**	**8.6 ± 0.4**	**0.241**
Mean weight (g)	**1136 ± 23^{a}**	**1415 ± 25^{b}**	**1649 ± 20^{c}**	**<0.001**
Litter weight gain 0-24h (LWG, kg)	**1.6±0.1^{a}**	**2.0±0.1^{b}**	**2.2±0.1^{b}**	**0.004**
Colostrum Yield (CY, kg)	**3.9±0.1^{a}**	**4.8±0.2^{b}**	**5.2±0.1^{b}**	**<0.001**

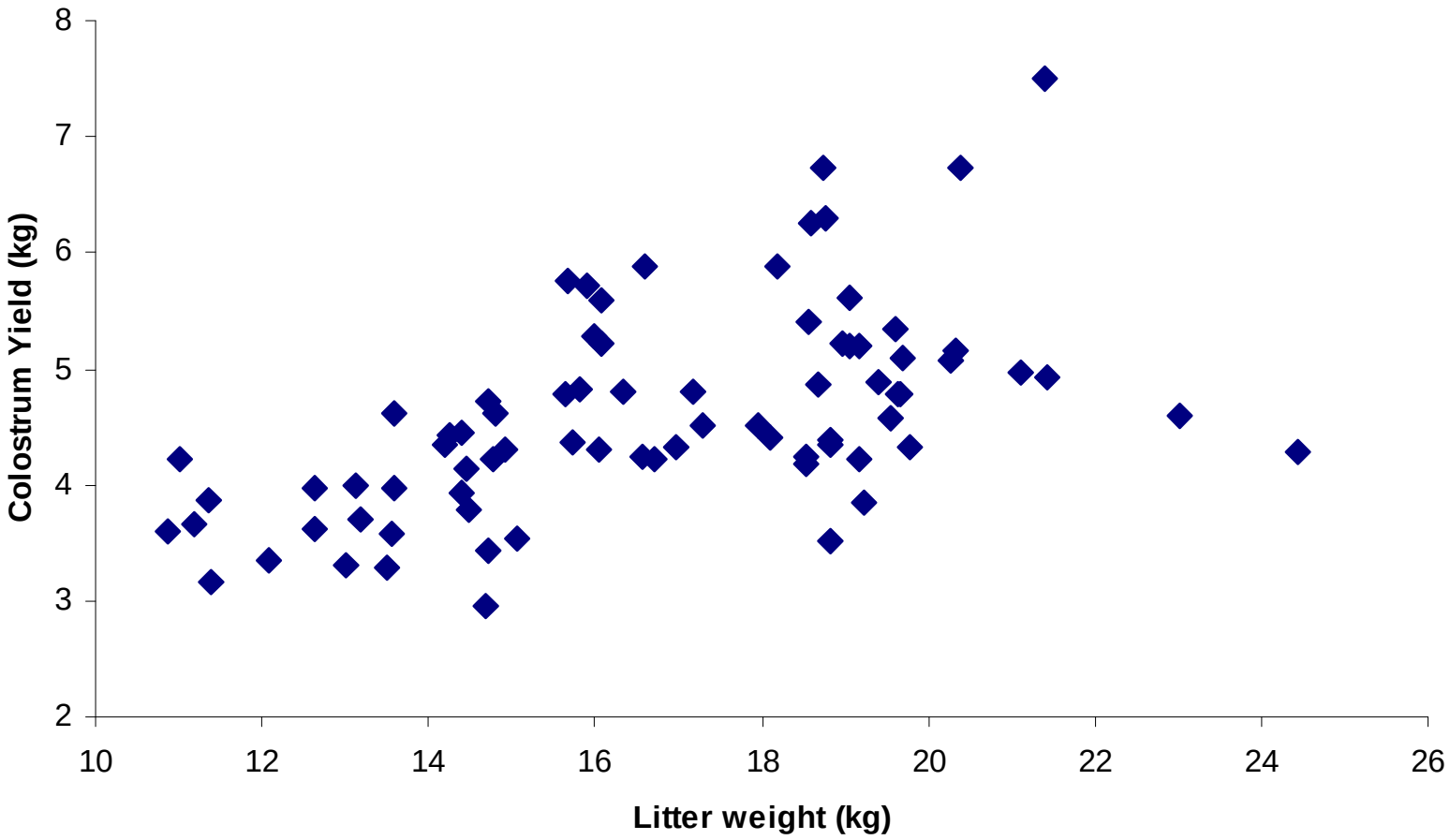
RESULTS/DISCUSSION



CY = 2031 + 1.4*LWG; R^2= 0.86; P<0.001 – independent of litter type

► Litter weight gain is a good marker for colostrum yield

RESULTS/DISCUSSION



CY = 1919 + 0.16*LWSP; R^2= 0.30; P<0.001

► Colostrum yield is positively influenced by litter weight

RESULTS/DISCUSSION

Experimental litters - piglets

	Uniform light (UL)	Uniform Average (UA)	Uniform Heavy (UH)	*P*-value
Colostrum intake (g)	**335 ± 13^{a}**	**400 ± 14^{b}**	**436 ± 12^{b}**	**<0.001**
Colostrum Intake/kg BW (g)	**304 ± 9**	**299 ± 10**	**275 ± 8**	**0.165**
CV of colostrum intake (%)	**22.5**	**23.7**	**23.6**	**0.652**
Mortality rate 0-21d (%)	**9.6**	**7.6**	**8.3**	**ns**

Global Mortality rate = 8.5%

Mean age of death = 4d

64% of losses were register until d3

RESULTS/DISCUSSION

Experimental litters - piglets

	Uniform light (UL)	Uniform Average (UA)	Uniform Heavy (UH)	*P*-value
Average daily gain 0-21d (g)	**212 ± 3^{a}**	**230 ± 4^{b}**	**239 ± 3^{b}**	**<0.001**
Mean weight at 21d (kg)	**5.6 ± 0.2^{a}**	**6.4 ± 0.2^{b}**	**6.7 ± 0.1^{b}**	**<0.001**
CV of 21d weight	**17.0**	**16.4**	**16.5**	**0.839**

DISCUSSION

CROSS-FORESTING PRIOR COLOSTRUM INTAKE ≠ THAN FARM PROCEDURE

COLOSTRUM RICH IN CELLS

EX: LYMPHOCYTES

→ CROSS PIGLETS INTESTINAL EPITHELIUM → FOUND IN GENERAL CIRCULATION

ONLY IF FROM NATURAL MOTHER

- MANY PIGLETS NOT NURSED BY THEIR NATURAL MOTHERS

- IMPACTS OF OUR PROCEDURE?

CONCLUSIONS/TAKE HOME MESSAGES

Litter uniformity

low pre-weaning mortality

≠ Mean Weights

No influence on weaned piglets number

≠ Mean Weights

Influences growth and weaning weight

Selection for uniformity is advisable

Effects of mean weight of uniform litters on sows and piglets performance

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