# Update on puppies' body weight record: a powerful tool to manage their health

Aurélien GRELLET, DVM, PhD Toulouse National Veterinary School Toulouse, France





### Neocare Center – National Vet School of Toulouse



Néonatologie des Carnivores Reproduction et Elevage







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### NeoCare : a team

#### Dr Sylvie CHASTANT Professor





Florine GUIRAUD Vet Nurse

NeoCare

#### Dr Aurélien GRELLET Research Engineer





Dr Amélie MUGNIER PhD Student

#### Dr Hanna MILA Assistant professor





Dr Patricia RONSIN Clinician



### NeoCare : vet students working with us

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Joelle Emeline Amélie Camille Baptiste Julie Manon Louise **MORINIAUX** OGER QUERTINMONT TONIOLO VIAUD PIEL **RIBARD SCHIEBEL** 



### NeoCare, Breeders, Veterinarians



### Clinical research



## Collaborations

### ROYAL CANIN







### ACADEMIA

Dr Hanna MILA Assistant professor





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Neonatal period in the dog : Immunological and nutritional determinants for survival





### Classification of neonatal mortality







# Definition of neonatal mortality between birth and 2 month of age





### Neonatal mortality is it frequent ?









# Big data in canine breeding





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### **GUIDE** D'UTILISATION





### Data 2010-2014





## Mortality in puppies



## Neonatal mortality is high in kittens like in puppies



## Effect of breed size and breed on neonatal mortality

	Mini	Medium	Maxi	Giant
Adult weight (kg)	<10	10-25	25-45	>45
Number of included heats	25,707	8,006	9,405	2,794
Prolificacy <sup>#</sup>	4.3 ± 2.0 <sup>a</sup>	6.1 ± 2.6 <sup>b</sup>	7.2 ± 3.1 <sup>c</sup>	7.4 ± 3.6 <sup>c</sup>
Stillbirth rate* (%)	7.3 <sup>a</sup>	6.3 <sup>a</sup>	7.4 <sup>b</sup>	10.0 <sup>c</sup>
Post-natal mortality rate <sup>\$</sup> (%)	6.8 <sup>ab</sup>	5.1 <sup>b</sup>	5.4 <sup>bc</sup>	6.2 <sup>c</sup>
Number of puppies sold/ whelped bitch	3.7 ± 2.0 <sup>a</sup>	5.4 ± 2.6 <sup>b</sup>	6.3 ± 2.9 <sup>c</sup>	6.2 ± 3.3 <sup>c</sup>

	Chihuahua	Cavalier King Charles	Yorkshire terrier	French Bouledogue
Number of included heats	2,973	2,561	2,527	1,724
Prolificacy <sup>#</sup>	3.5 ± 1.6ª	4.4 ± 2.0 <sup>b</sup>	3.7 ± 1.7 <sup>c</sup>	4.9 ± 2.2 <sup>d</sup>
Stillbirth rate* (%)	8.0 <sup>a</sup>	8.8 <sup>ab</sup>	7.4 <sup>a</sup>	10.3 <sup>b</sup>
Post-natal mortality rate <sup>\$</sup> (%)	7.1 <sup>a</sup>	7.5 <sup>ª</sup>	6.9 <sup>a</sup>	10.2 <sup>b</sup>
Number of puppies sold/whelped bitch	3.0 ± 1.6 <sup>a</sup>	3.7 ± 2.0 <sup>b</sup>	3.2 ± 1.7 <sup>c</sup>	4.0 ± 2.2 <sup>d</sup>





# Try to detect simple and useful tools to predict neonatal mortality





## Birth weight and early growth : one of this tool



# What we learned ?



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# Birth weight

# Early Growth



# Kittens present a very low weight at birth (compare to their adult body weight)



## Birth weight influence neonatal mortality



### Low birth weigh neonates are very particular





. . . .

## And what happens if they survive?



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# Birth weight

# Early Growth Growth rate 0-2 days



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### Growth rate between birth and 2 days





Weight change in puppies alive and dying between 2-21 days



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## Early growth rate influence neonatal mortality





Data on n=477 puppies, p<0.001

71.5 % among all dying puppies



### Growth rate reflect the colostrum ingestion



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### Colostrum ingestion is crutial for neonatal health





Limited IgG transfer during gestation in dog

% of total immunity acquired during gestation











### Passive immune transfer **only** during the first 24 hours of life



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### Correlation between early growth rate and IgG concentration



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### Illustration of immunity gap



- Low birth weight puppies are at risk of death
- Puppies with a negative growth rate are at risk of death
- Growth rate reflect the colostrum intake and so the passive immune transfer





### So what to do in practice?





### **Good practice**

### Birth weight



### Stimulate colostrum intake







### Birth at two days





### Evaluation of growth rate



### Good practice

- Low birth weight
- Negative growth rate

Supplementation with a milk replacer





### What to do before feeding ?





## Check the puppies' rectal temperature before meals





## Which milk replacer ?





### Composition of dog and cat milks are very close

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# Composition of dog and cat milk is different from cow and goat milk



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### In adult cats starch is digested by amylase





# Neonates don't have amylase during the first 3 weeks of life



Buddington et al. Activities of gastric, pancreatic, and intestinal brush-border membrane enzymes during postnatal development of dogs. AJVR, 2003, 64 (5) 627-634.



### Addition of DHA has shown benefic effects on the brain and retinal functions





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Bauer JE et al. Retinal Functions of Young Dogs Are Improved and Maternal Plasma Phospholipids Are Altered with Diets Containing Long-Chain n-3 Polyunsaturated Fatty Acids during Gestation, Lactation, and after Weaning J. Nutr. 136: 19915–1994S, 2006.



### How often ?





### Check meals regularity & amount consumed

Semaine / week	<b>X</b> (24H-	ADULT'AGE			
Woche / semana settimana / veckor		MINI 1-10kg <sup>(2)</sup>	MEDIUM 11-25kg	MAXI 26-44kg	GIANT >45kg
1	x8	3-10 ml <sup>(3)</sup>	5-20 ml	10-25 ml	15-35 ml
2	x5	10-30 ml	15-50 ml	30-70 ml	40-80 ml
3	x4	20-50 ml	35-90 ml	60-120 ml	85-125 ml
4	x4	25-60 ml	45-125 ml	90-170 ml	120-190 ml

<sup>(1)</sup> uge / uke / viikossa / tydzień / hét / неделя / тиждень / 週 / 周

<sup>(2)</sup> кг/千克 <sup>(3)</sup> мл/毫升



# Significant decrease of neonates at risk in case of supplementation





## How to give the milk?





# Bottle feeding and tube feeding (used by vet in case of emergency) are two technics to feed neonates



Using spoons and droppers to feed kittens and puppies is dangerous because the limited gag reflex of these animals easily permits aspiration of formula into the lungs.





## What to do after ?





### Don't forget to stimulate the perineum







## In the next steps what we are doing?







### Birth weight depends on breed



Mean birth weight 700 g

Mean birth weight 100 g



### Objective threshold of low birth weight





## Fœtal programming





#### Help us to define an optimal growth in puppies

Dear Madame /Sir,

The research interests of the Reproduction Unit of the National Veterinary School of Toulouse (France) are in growth and in risk of mortality in puppies from birth until weaning. We have two objectives: -to build standard growth charts describing growth between birth and two months in puppies of each breed -to evaluate the impact of puppy's birth weight and growth during the first two months of life on risk of obesity, disease or mortality in each breed until adult life.

Results obtained from this questionnaire will provide you and other breeders with a useful tool in the monitoring puppies' health as well as in the early detection of puppies at a risk of death.

#### Which kind of information do we need?

If you weigh your puppies (regardless of the age at weighing and weighing frequency), we would be interested in your registered data. In addition to weight, the information useful for us are: the breed of puppy (puppies should be purebred), date of birth, and if possible the main characteristics of the litter (i.e. number of puppies). Even if the puppy died before two months of age, we are still interested by its birth weight and data on growth. If you register the microchip number and address of the new owner, we will be interested in this information too. We could contact the owner to get some information concerning current weight of the puppy or its adult bodyweight.

If you wish to participate in our study, please fill up the survey attached below and send it back together with your data on growth.

All your litters born after 2005 are of interest.

How to send us your data? The easiest way for you: scan, photo, excel document, paper sheets....

You can send us these data via - email: repro@envt.fr

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### repro@envt.fr

#### **Dr Amélie MUGNIER**





## If you want to know more....

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#### Repro@envt.fr

