



Faculty of Health and Medical Sciences



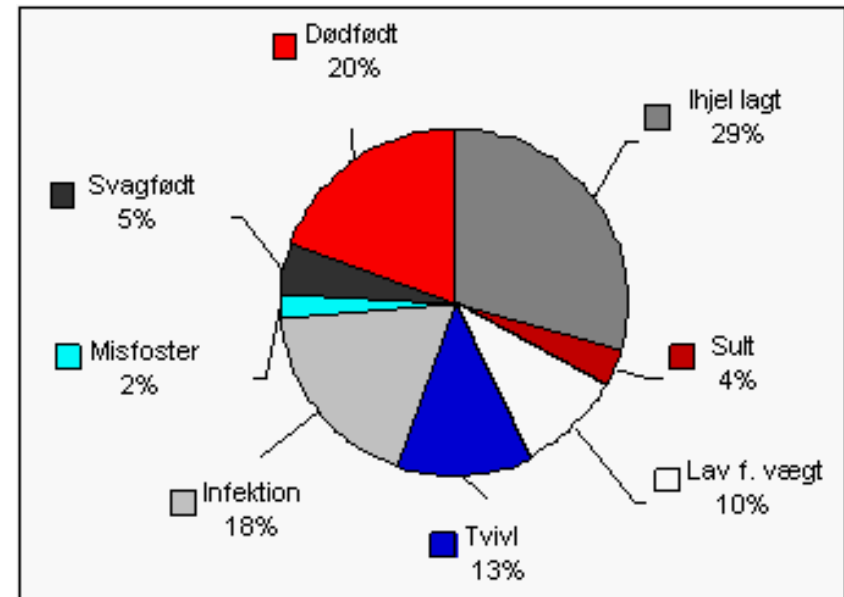
# Neonatal pigs with low birth weight-immunity and infection susceptibility

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# Mortality in newborn pigs (up to 20%)

Dødsårsag	Eventuelle obduktionsfund
Dødfødt	<ul style="list-style-type: none"> <li>- Lungeprøve: Udtaget Lungevæv flyder ikke i vand.</li> <li>- Lungerne er mørkerøde ("lever-lignende"). Uanset fødselsvægt.</li> </ul>
Svagfødt	Tilsyneladende normal levedygtig gris uden tegn på trauma, ofte indhyllet i fødselshinder.
Trauma	<ul style="list-style-type: none"> <li>- Tilsyneladende normale, sunde og levedygtige grise.</li> <li>- Eksterne tegn på, at grisen er lagt /trådt på i form af sår/rifter/brud, knust hjerneskal og/eller fladtrykt krop.</li> <li>- Interne tegn på trauma i form af blodansamlinger under huden, væske i bughulen.</li> </ul>
Infektion	<ul style="list-style-type: none"> <li>- Tarmudfald som følge af kastration af grise med lyskebrok.</li> <li>- Tarmlidelser: Tydelige kartegninger i tarmene, væske- og luftfyldte tarme, tarmindehold vandigt/gulligt/gråligt (Tarmbrand: Tarmene grå, tværstribede, nekrotiserede)</li> <li>- Blodforgiftning: Organerne i bughulen ligger i en stor klump i hinder, lever stor/opsvulmet</li> </ul>
Sult	<ul style="list-style-type: none"> <li>- Ingen mælk i ventrikel og tarme (kun meconium)</li> <li>- Meget røde tarme</li> <li>- Luft i ventrikel og tarme</li> <li>- Evt. mager og/eller dehydreret</li> </ul>
Lav fødselsvægt	Vægt ved død under eller lig med 700 g.
Misfoster	Deformiteter, der gør grisen ude af stand til at overleve
Ukendt	Ikke muligt at fastslå dødsårsag (ofte pga. forrådnelse)



# Mortality in newborn low birth weight pigs

Table 1 - Effect of piglet birthweight on mortality rate (MR), total and percentage, from birth to slaughter

Category	Born alive	MR 0-7 days		MR 0-21 days		MR 21-59 days		MR 59-168 days	
	n	n	%	n	%	n	%	n	%
< 600	82	31	37.8a	41	50.0a	1	2.4	0	0.0
601-800	266	50	18.8b	76	28.6b	6	3.2	0	0.0
801-1000	617	60	9.7c	105	17.0c	6	1.2	3	0.6
1001-1200	982	60	6.1d	87	8.9d	8	0.9	4	0.5
1201-1400	1259	64	5.1de	102	8.1de	12	1.0	3	0.3
1401-1600	1086	37	3.4ef	61	5.6ef	14	1.4	4	0.4
1601-1800	753	25	3.3ef	39	5.2f	6	0.8	2	0.3
> 1801	457	12	2.6f	21	4.6f	6	1.4	4	0.9
Total	5502	339	-	532	-	59	-	20	-

23%  
7%

a-f - Differences between means in the column with different letters are significant by the Fisher's exact test (P<0.05).

Reason: sibling competition for nutrition, poor immunity and infection resistance?

# Hypothesis

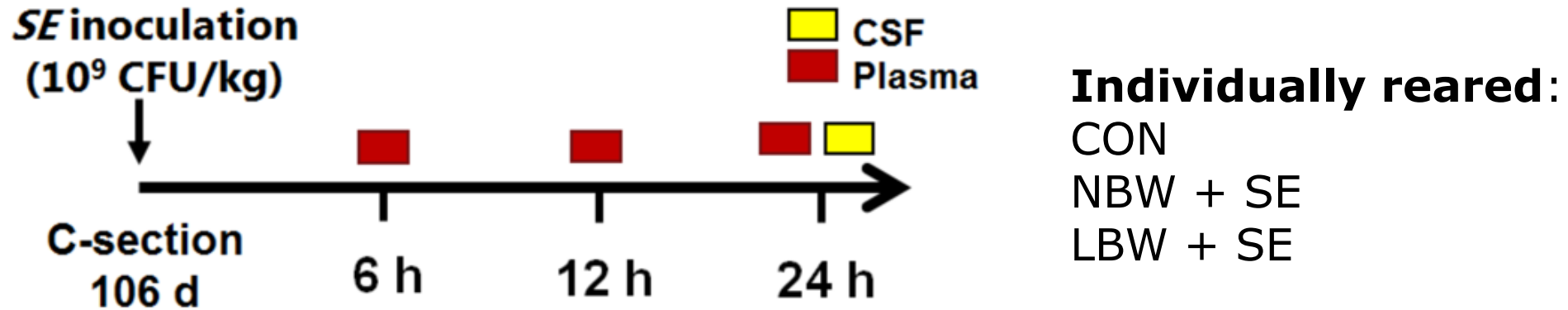
High mortality in LBW newborn pigs:

- Mainly derived from impaired immunity against external challenge
- Leading to increased risk of infection and sepsis

→ Preterm pigs as a sensitive model for weak industrial pigs.

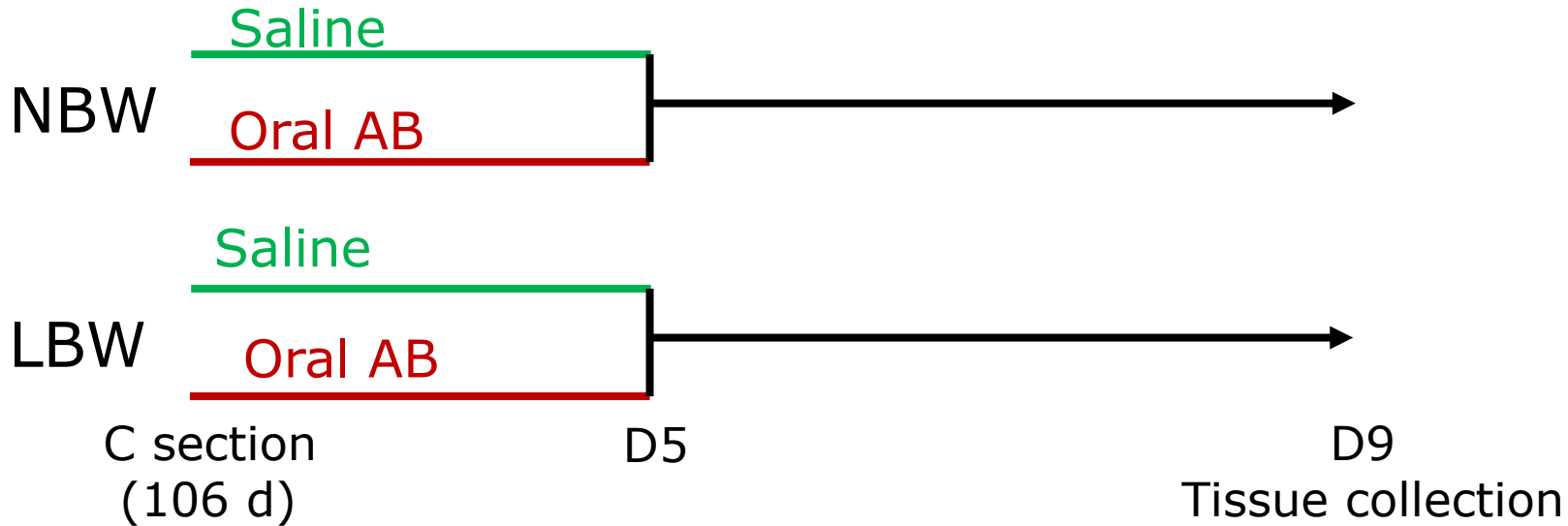
LBW: those with the lowest 25% BW within the litter.

# Sepsis susceptibility after infection challenge



- Clinical responses
- Hematology
- Blood gas

# Susceptibility to spontaneous infection



- Bone marrow bacterial accumulation at euthanasia (infection)
- Hematology
- Blood immune cell subsets and functions

# Conclusion

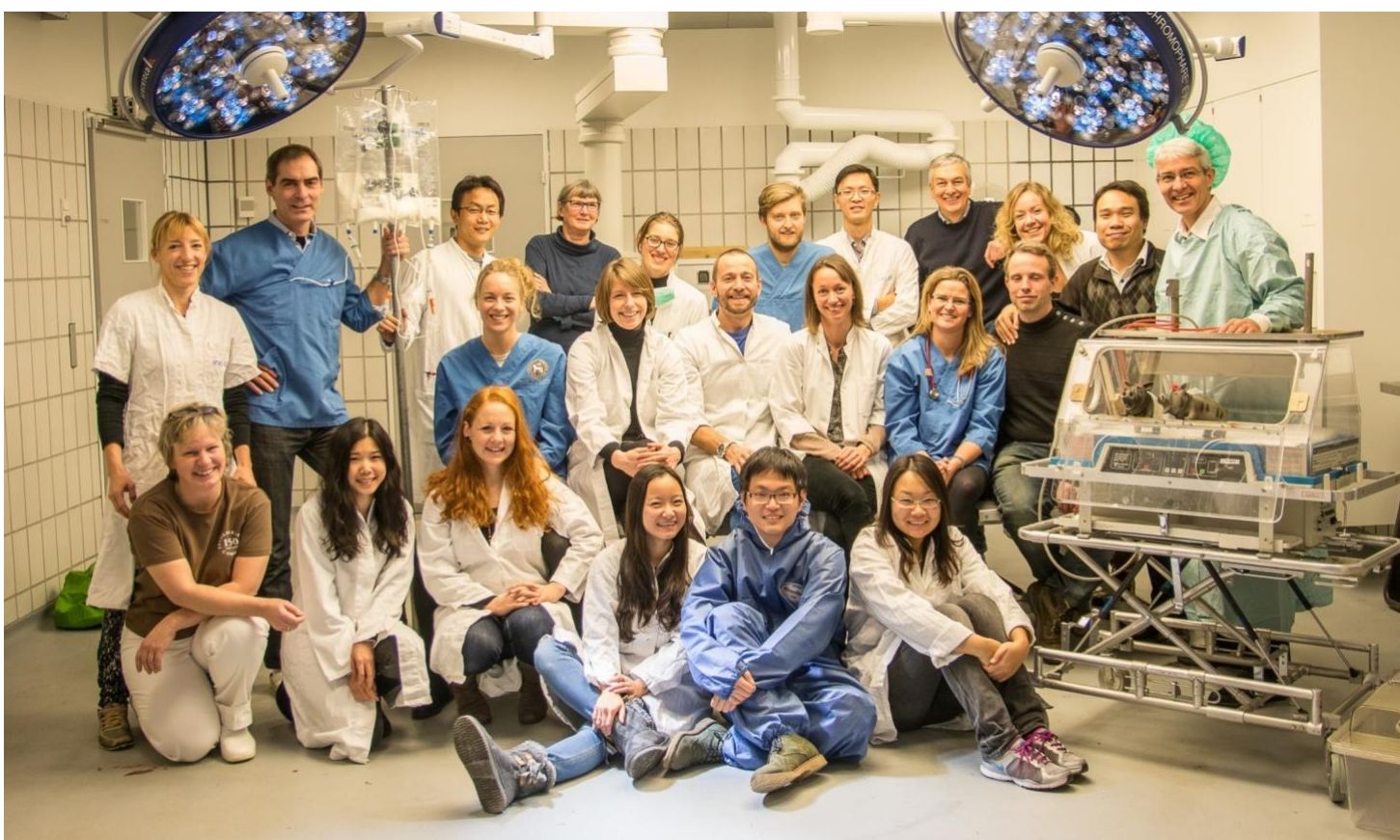
Newborn LBW pigs had:

- Impaired immune competence (in vitro challenge)
- Higher susceptibility to sepsis following infection challenge
- Higher susceptibility to spontaneous infection

Perspectives:

- Higher mortality of newborn LBW pigs mainly derived from high infection risks
- May need separate interventions/rearing system for weak pigs?

# Acknowledgement



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