Weaning without zinc in practice – How?

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1

Weaning without zinc

- Minimize variation in the week batches = consistant pigs
- Wean those pigs who have learned to eat and digest
- Make sure that the weaner section is cleaned, disinfected, heated and that the water pipes are cleaned.
- Help the pigs to get started with soaked feed
- FeedMixes low in protein with extra fibres
- Acid profile in feed (5-10 kg /tons)
- Organic acids on the water (pH < 4)
- Don't forget that the foster piglets also get diarrhea 4 days after weaning.

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VARIATION IN WEEK BATCHES

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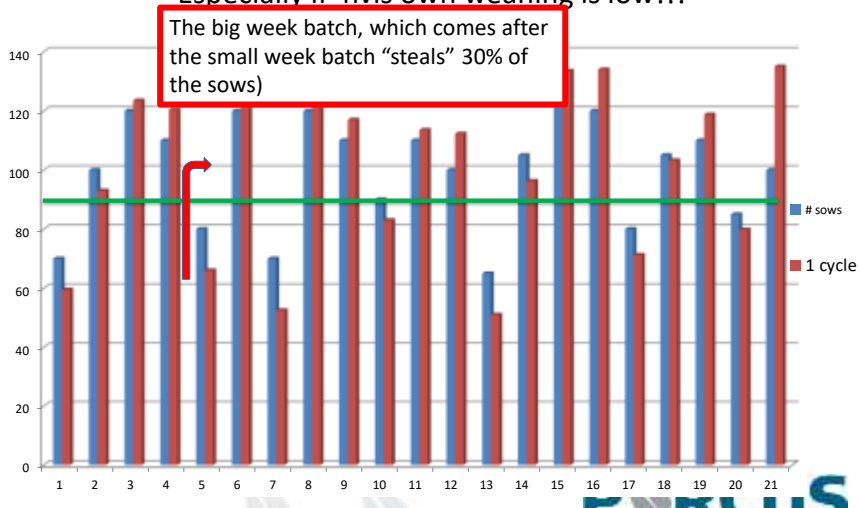
Great variation in the number of sows per week batch gives great variation in weaning age in weaner section

Especially if hvis own weaning is low!!!



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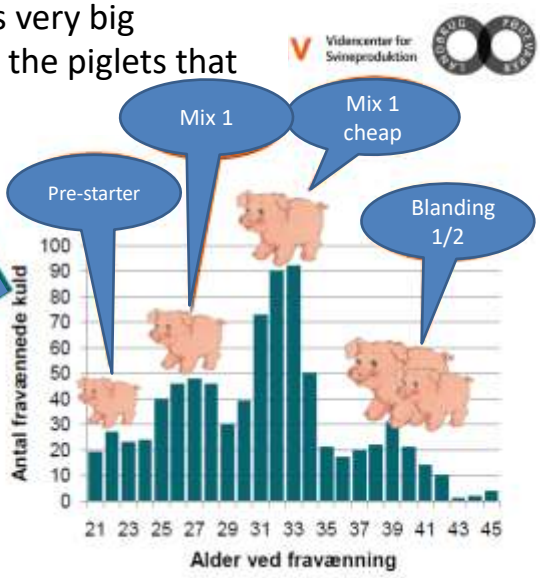
Often there is very big difference on the piglets that are weaned.

Differentiated feeding



Modificeret fra Seges

SVINEPRODUKTIONSRÅDGIVER

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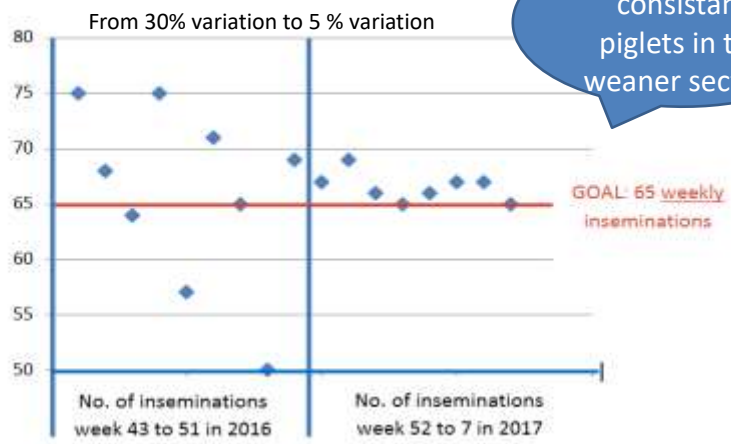
Consistant week batches

The number of young females (polte) who are on Altrezyn are decided by the size of the week batch and the number of culled sows.

A lot more consistant piglets in the weaner section



7

PIGLETS, WHO CAN EAT AND DIGEST PRIOR TO WEANING GET LESS DIARRHEA AND GROW FASTER IN THE WEANER SECTION

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Feed uptake in the farowing section

Trials done by putting colour in the feed and swab the piglets' behind before weaning

- Only 60% of the piglets at 8 kg have learned to eat before weaning
  - Anne Marie Van Bussel, Holland 2013
- Only 50% of the piglets at 6 kg have learned to eat before weaning
  - Agerley Danmark 2017
- **Pigs, who have learned to eat and digest in the farrowing stable grow + 50 grams and have less diarrhea.**
- **Being able to eat and digest after weaning means more for the growth in the weaner section than the weight at weaning. This explains 50 % of inequality**

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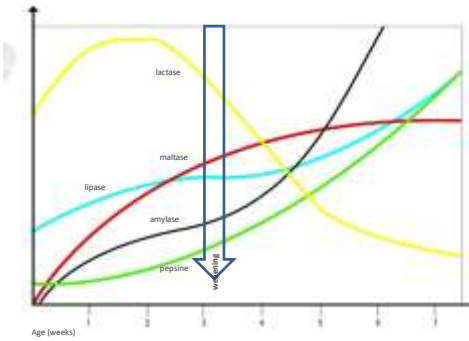
The piglets must be able to eat and digest

1. **Learn to put feed in the mouth**
2. **Change of intestinal flora**
3. **Enzyme training**



Which enzyme "breaks" which nutrient:

- **Lactase: lactose** (milksugar)
- **Maltase: maltose** (sugar)
- **Lipase: fats**
- **Amylase: starch**
- **Pepsine: proteines**

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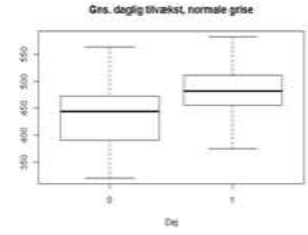
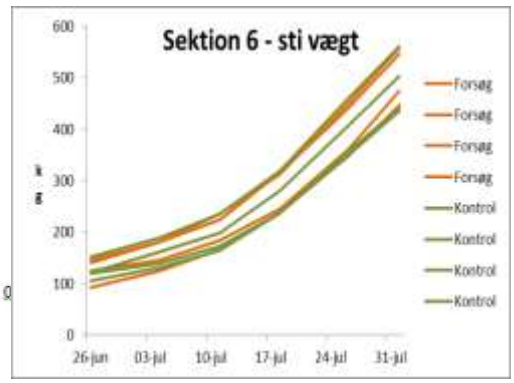
Daily gain in the weaner section

- +44 Grams per day in piglets, who have eaten 400g vegetable feed in the farrowing stable
- +44 grams/day = 2 kg more after 7 weeks in weaner section



mean in group 0 mean in group 1
437.3835 481.7646

p-value = 0



11

Feeding of piglets

- High feed uptake in the farrowing stable before weaning >400 gram foder
- Keep score of amount of feed per week/ number of piglets weaned
- Piglets don't eat old feed!!
- Piglets don't grow from feed in the manure!!
- Use a bowl for feeding. The bowl must be nearly empty at next feeding.
- Throw some feed in front of the sow. The sow will teach the piglets to eat.
- Feed at least 3-4 times daily
- Combination of training feed (day 4-8) and regular piglet feed (day 8 – end) works well

12

Feeding of piglets

- Wet feed for piglets increases the feed intake and you don't feed as often.
  - Watch out for PH and hygene (especially when milk in feed)
- Milking system
  - Gives stronger piglets but not so much enzyme training (milk piglets)
  - Turn off the milk in day time after 12-14 days and feed the piglets
  - Turn off the milk at least the last week.

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START-UP IN THE WEANER SECTION

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Preparing the stable

- Thorough cleaning using soap and desinfection afterwards.
- Thorough drying-up ca. 0,4 L oil per m2. Don't turn off the heater until the pigs arrive.
- Water desinfektion between each batch and check of drinking niples.
- Drip watering
- Make sure there's water and feed in the automats at arrival

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FEEDING AND FEED INTAKE

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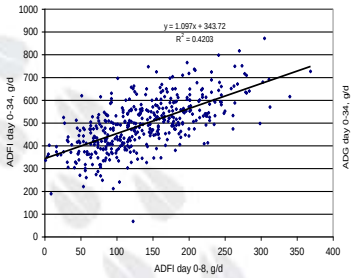
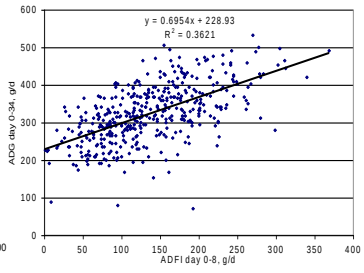
1 week of feed intake/gain predicts 40% of daily gain in the weaner section!!

- **Goal: 150 g/day the first week after weaning**
- **+ 100 grams daily gain 1 week = 40 grams daily gain for the rest of the period**





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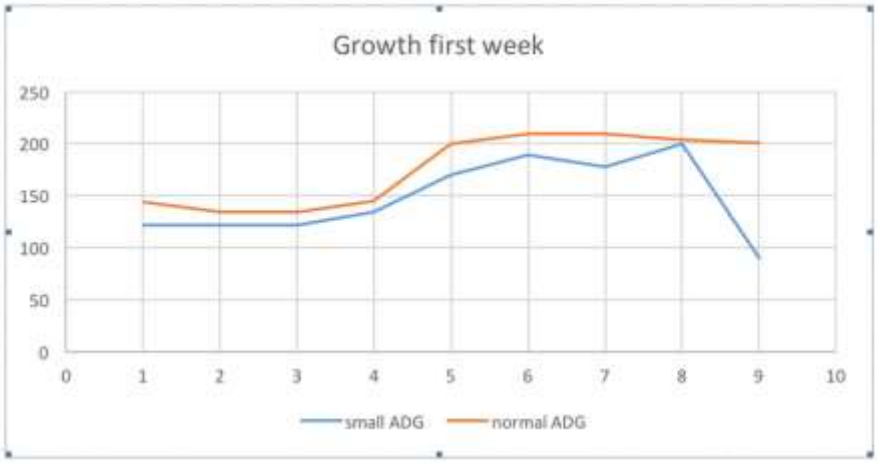
Supervision of 1 week daily gain at simple weight batches day 0-7

Goal: 150 g/d or feed intake of 1,5-2 kg feed



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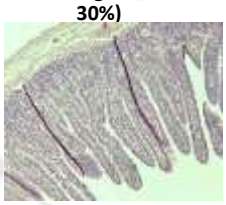
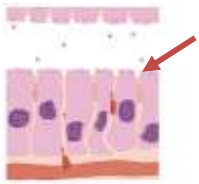
Why is it important to make pigs eat?

- **A piglet, who learns to eat before weaning will continue eating**
- **Piglets, who don't eat at weaning will be damaged in the intestinal wall (> 30%)**



Weaning

5 days after weaning



- **Reduced growth (feed intake lower than need of maintenance)**
- **Post weaning diarrhea!**
- **Leaky intestine. Diarrhea and entrance for bacteria/ toxins**
- **Long-terms consequences**
  - **Permanent damage -> poorer conversion of feed**
  - **Passage of bacteria and toxins - disease**

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What can we do to make the piglets start eating?

- Use some of the feed from the farrowing stable to get the pigs started.
- Soaked feed the first 3 days
  - In troughs or possibly in feeding system.
  - 2-3 times daily
  - Not too difficult when the pigs have learned to eat in the farrowing stable

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FORMULATION OF THE FEED

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Protein level

Undigested feed gives nutrition for coli bacteria!!!

Indigested feed is in the intestines when:
1) They are damaged (infection)
2) When the pig is not able to digest the feed!

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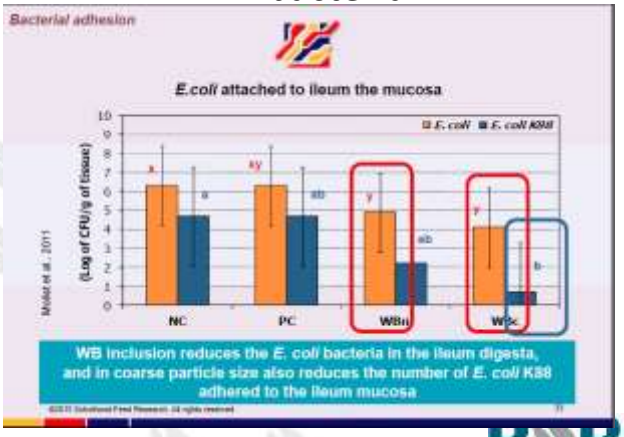
Dutch test

4% wheat bran (+ fibre – energy and – protein)
Resulted in up to 80% reduction of some of the coli bacteria



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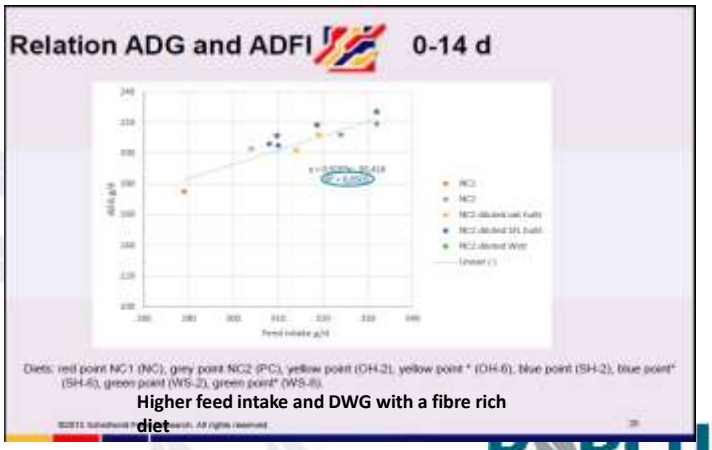
Piglets weaned on feed high on fibres grew better.

Better intestine health -> Higher feed intake



Higher feed intake and DWG with a fibre rich diet

24

Mix 1 (6-9 kg)

	Protective diet	Norm
Råprotein, gram ford. pr. FE	**118-126**	**130-138**
Protein, %	Max. 16-18 %	
Lycin, gram ford. pr. FE	10,0	11,0

Choice of ingredients	• Protein sources: No **soya**, milk powder, whey powder, fish meal, **blood plasma**, soya protein concentrate, EP, potato protein concentrate
	• Heatet grains
	• Barley (gerne 20-25%)
	  • Ændring af byg/hvede forhold (obs. på ekstra energitildeling)
	  • Syrevalset byg (5-10%)
	• Wheat bran (1-3%)
	• Oat	

Additionals	• 5-10 kg acid per tons
	  • Benzoic acid 0,5 %
	  • Other acids give best effect when mixing at least 1%
	• Probiotics (only few have documentet effect)
	  • MiyaGold, Bio2PlusB
	• **Lavt Ca2+ -> Use CaFo (Calcium Formiat)**	

25

MIX 2 (9-15 kg)

	Protective diet	Norm
Råprotein, gram ford. pr. FE	**125-133**	**132-140**
Protein, %	Max 18 %	
Lycin, gram ford. pr. FE	10,5	11,0

Choice of ingredients	• Protein sources: a little soya (0-7%), alphasoy, milk powder, whey powder, fish meal, blood plasma, soya protein concentrate, EP, potato protein concentrate
	• Barley (preferably 20-25%)
	  • Change of barley/wheat relations (obs. on extra energy)
	  • Syrevalset byg (5-10%)
	• Wheat bran (1-3%)
	• Oat	

Additionals	• 5-10 kg syre pr. tons
	  • Benzoic acid 0,5 %
	  • Other acids give best effect when mixing at least 1%	

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MIX 3 (15-30 kg)

	Protective diet	Norm
Råprotein, gram ford. pr. FE	**137-145**	**143-151**
Protein, %	Max 19 % – nogle kan komme op på 23-25%, hvis god start på Bl.1 og Bl.2	
Lycin, gram ford. pr. FE	11,0	11,5
Choice of ingredients	• Protein source: Soya • 10-15% barley • 85-90% wheat	
Additionals		

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ACIDPRODUCTS ON THE WATER SYSTEM

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Acidsmixes for water

- Organic acids in feed on water help proteine digestion -> less feed for the bacteria
- Mixed Acid products with MCFA etc. Cost more than simple formic acid but the effect is better

	MCFA	Benzoic acid	Butyric acid	Formic acid	Citric acid	Lactic acid	Fumaric acid	Acetic acid	Prop. acid
pH (bacteriostatic)	0	0	0	+	++	++	++	0	0
Intra-bacterial activity	+++	+++	+	+	0	0	0	+	+
Anti-viral	+++	+	0	0/+	++	0	0	0/+	0/+
Gut morphology	+++	0	+++	+	+	+	+	+	+
Gut microbiota	++	-	0	-	-	+	+	0	0
Reducing pathogen virulence	++	0/+	+	-	+	++	+	-	+
Immunity	+++	++	+++	0	0	+	+	+	+
Antifungal	++	++	++	0	0	0/+	-	++	+++

Table 2: Overview of activities of different acids. '+' = positive impact, '0' = no impact, '-' = can have negative effect, '0/+' = native acid has no effect, but derivatives have some.

29

Effect against E-coli depends on the pH!!

Acid	pH 4	pH 6
Formic acid	+++	+
Butyric acid	+++	+
Lactic acid	+++	+++

ID-TNO Leleystad Nr 2066 v.d. Meulen, J.

Set acid inclusion depending on pH measurements

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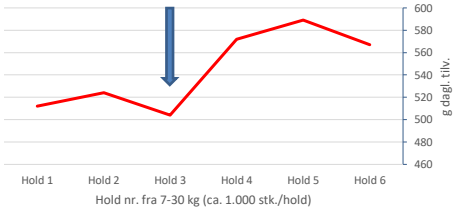
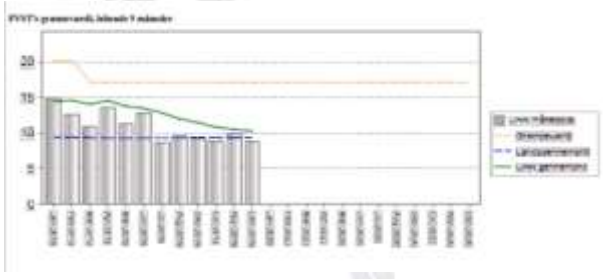
Upstart of Acidmixes on water

Very good effect from Acid mixes with MCFA etc. The first 3-4 weeks after weaning





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THREATMENTS WITH ANTIBIOTICS

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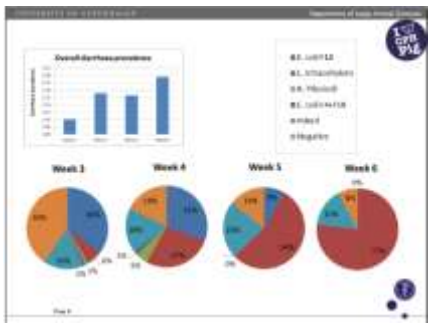
The aim is to wean piglets without the use of extra ZNO

E-coli diarrhea still needs to be treated

- Weaning diarrhea day 4
- Remember foster piglets do not get diarrhea the same day !!!
  - Can be treated separately in through
- E-coli diarrhea when changing feed mix 1->mix2
- If the diarrhea returns after treatment there is too much protein in the gut



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My experiences with weaning without extra zinc
Hans Jørgen Hansen

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Progress

- Sales meeting in 2016 with a lecture on a miracle remedy that could replace Zinc
- The product was expensive and did not work!!
- Agreed on procedure with the veterinarian with a focus on simple changes that have an effect on intestinal health.
- Have weaned pigs without extra zinc for 5 years now
- We have better health and productivity in weaner sections and finisher barns than before.

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Changes

- Sales meeting in 2016 with a lecture on a miracle remedy that could replace Zinc
- The product was expensive and did not work!!

- Have not used zinc for 5 years
- Incitament -> lecture on a better miracle remedy -> provoked by veterinarian
- Had to find a solution
  - Rolled barley fibres in big flakes
  - Protein level down – do not feed coli bacteria
  - 1/2 Coliprotec
  - 10,5,5,4 kg/tons acid
  - Get started! Better now than under pressure
- Good to start while zinc is still available. Zinc works well.
- Soft shifts of feed during 7 days
- Result better than before
  - Cheaper – zinc
  - No register of use
  - Low use of antibiotics

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Changes of feed

- Mix 1 and Mix 2 were diluted with rolled barley
- We came down in protein level and up in fiber level.
- The rolled barley delivers larger fibre flakes that are good for intestinal health.
- We went down in "protein pressure" so the pig could absorb all the protein -> better intestinal health
- We hit approx. 125 - 128g / for crude protein in mixture 1 (Corresponds to the protective diet norm today)
- Acid profile was increased in the feed.
- Soft feed shifts during 7 days were implemented
- We use ½ dose Coliprotec at weaning

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Results

Without medical zinc

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- **0,5% dead**
- **+ 50 grams daily gain**
- **0,14 Fe/kg.tv**

Results

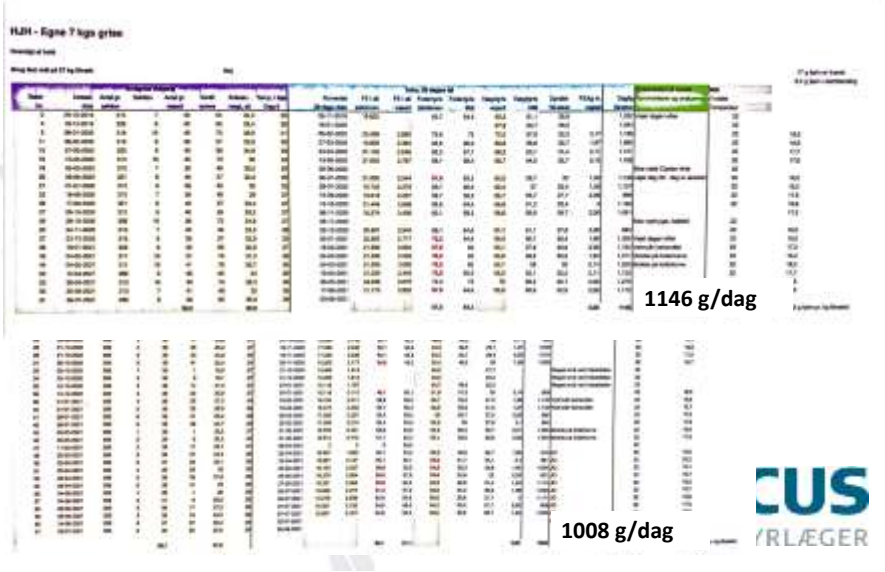
Produktion		Plan	w/out Zink 01.07.18 30.06.21	w/out Zink 01.07.17 30.06.18	Miracle remedy 01.04.16 30.06.17	with Zink 01.01.15 31.03.16	with Zink 01.01.15 30.06.21
STATUS			uden	uden	Forsøg	med Zink	
Dage i perioden	Dage		1.096	365	456	456	2.373
PRODUKTION							
Gns. vægt ved indgang	Kg		7,2	7,0	7,5	7,4	7,2
Tilvækst/prod. gris	Kg		26,6	26,6	24,8	26,2	26,2
NØGLETAL							
Prod. grise	Stk		22.290	7.345	9.196	8.925	47.765
Døde i % af prod. grise	%		1,0	1,2	1,5	1,7	1,3
Daglig tilvækst	Gr		541	528	498	494	522
Referencetilvækst 7 til 100 kg (Faste værdier)	Gr		781	770	725	712	755
Referencetilvækst 7 til 30 kg (Faste værdier)	Gr		513	506	476	468	496
Reference FEsv/kg tilvækst 7-30kg	Energ i		1,68	1,71	1,75	1,82	1,72
Foderdage / prod. gris	Dage		49	50	50	53	50
Dyreenheder i perioden	DE		120	39	46	47	253
Staldudnyttelse	%						
Foderforbrug / prod. gris	FEsv		46	46	44	48	46
FEsv/kg tilvækst	FEsv		1,72	1,74	1,78	1,85	1,75
Foderstyrke/dag	FEsv		0,93	0,92	0,89	0,91	0,92
Dyreenheder i perioden (gyldig fra 01-08-2014)	DE		115	38	44	45	242

39

Results finisher pigs

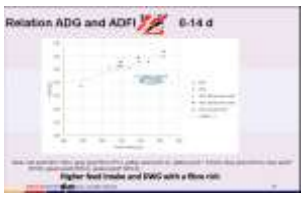
28 days of growth

Pigs weaned without zinc get a better start



40

Rolled barley



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41

Feed recipes

Mix 1

133 g. Digest. Raw protein before dilution with 10% rolled barley

10,5 kg/tons organic acid

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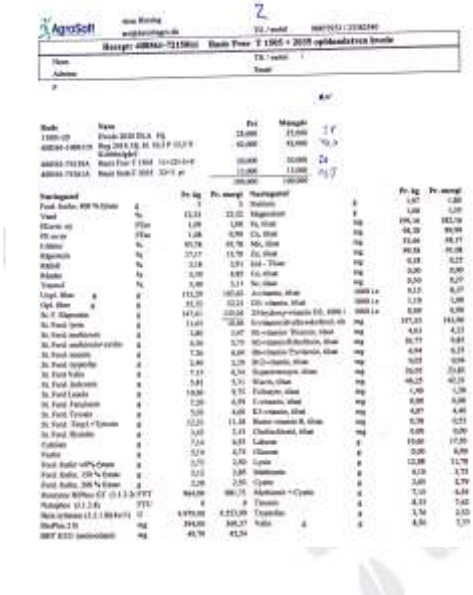
Feed recipes



Mix 2

133 g. Digest. Raw protein Incl. 10% rolled barley

5 kg/tons organic acid

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Feed recipes


Danish Agro

PRODUKTKORT

Basis Små-T 2035 22+3 pi

Tilskudsfoder til smågrise fra 5 til 8 uge efter fravænning.

Mix 3

130 g. Digest. Raw protein
Incl. 10% rolled barley

4 kg/tons organic acid

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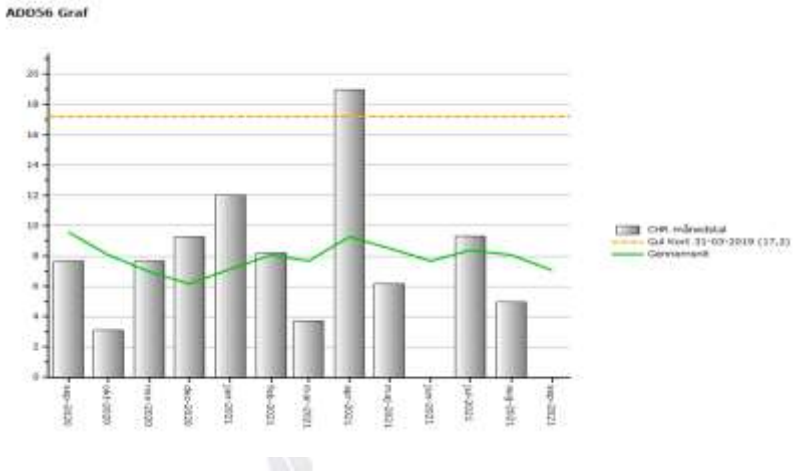
Use of antibiotics is below national average

We are still treating post weaning diarrhea if it occurs!!



45

Take Home

- Result much better than before
  - Cheaper feed since extra zinc is saved
  - No register of use
  - Low use of antibiotics
- Important to start while zinc is still available. Zinc works well.
- Fokus on changes in management and feeding instead of expensive ”Miracle products”.

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46

Take Home

- Minimize variation in the week batches = consistant pigs
- Wean those pigs who have learned to eat and digest
- Make sure that the weaner section is cleaned, disinfected, heated and that the water pipes are cleaned.
- Help the pigs to get started with soaked feed
- FeedMixes low in protein with extra fibres
- Acid profile in feed (5-10 kg /tons)
- Organic acids on the water (pH < 4)
- Don’t forget that the foster piglets also get diarrhea 4 days after weaning.

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47