The Danish practical approach
-Weaning without medical levels of zinc

Nicolai Rosager Weber, DVM, PhD
SEGES Danish Pig Research Centre
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Outline of presentation

- Brief description of the Danish pig production
- Antibiotic regulations in Denmark
- The Danish zinc history
- Field experiences on weaning without medical doses of zinc oxide

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Danish pig production, 2018

- 3,100 farm units with pigs
- 1 million sows → 32.5 million pigs
  - 18.0 million slaughtered in Denmark – 90% exported
  - 14.5 million pigs exported at 30 kg to other European countries

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Productivity in the Danish pig production, 2017

	Key figures	Average 2017
Sow herds	Weaned pigs per year per sow	33.3
	Live-born pigs per litter	16.9
Weaner period	Average daily gain 7-30 kg, gram per day	453
	Feed conversion ratio 7-30 kg, kg per kg weight gained	1.88
	Mortality 7-30 kg, %	3.1
Finisher period	Average daily gain 30-110 kg, gram per day	971
	Feed conversion ratio 30-110 kg, kg per kg weight gained	2.79
	Mortality 30-100 kg, %	3.1

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Antibiotic regulations in the Danish pig production

- Antibiotics can only be prescribed by certified vets
- Sales and distribution through pharmacies
- No economic profit on prescribed drugs
- Growth promoters banned for approx. 20 years
- No preventive treatments allowed

- All professional pig herds = Herd Health Contracts
- Initiation of treatment by farmer after veterinary instructions

- Focus on reducing antibiotic use in food producing animals
- Denmark has a large pig industry = Main user of antibiotics

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The Yellow Card Initiative

- Established in 2010 by the Danish Veterinary and Food Administration
- Defines thresholds in Animal Daily Dose (ADD) per 100 animals per day
- If a herd exceeds thresholds = increased supervision and fees
- Thresholds have been regulated down **fives times** since 2010
- Differentiated ADDs on “high risk” antimicrobials
  - No use of:
    - Quinolones (2002), 3./4. g. Cephalosporins (2010) & Colistine (2017)

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Action plan – phasing out medical zinc in Danish pig production

Goal

1. No negative effect on animal welfare – increased disease frequency
2. Maintain a low and prudent antibiotic usage
3. Minimal negative effect on productivity and mortality

Actions points

1. Research and development – multiple disciplins and collaborators
2. Communication focus – new knowledge need to be implemented in the field
3. International focus – an urgent issue for all EU member states

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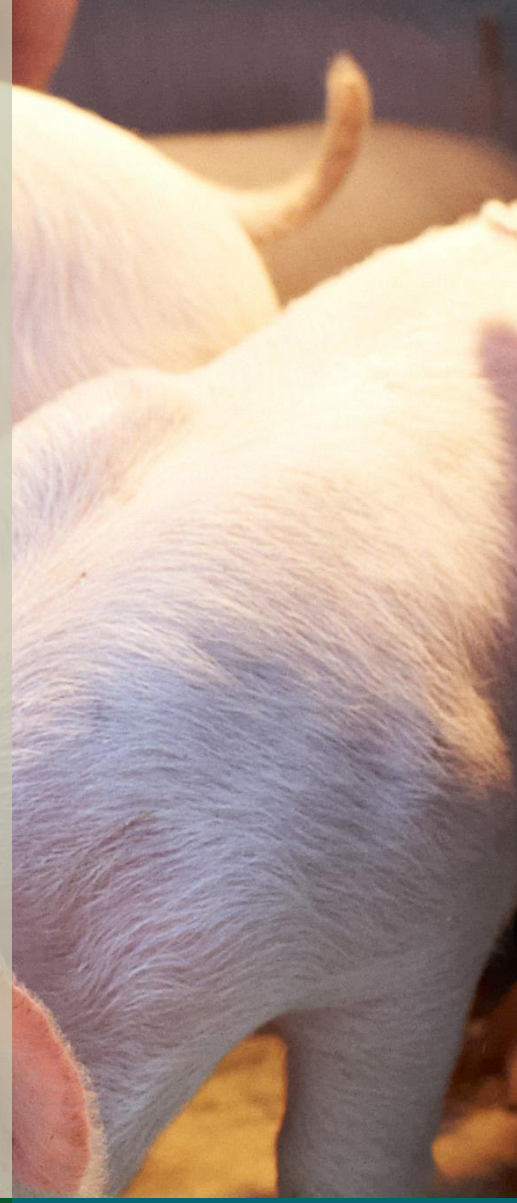
The zinc history in Danish pig production



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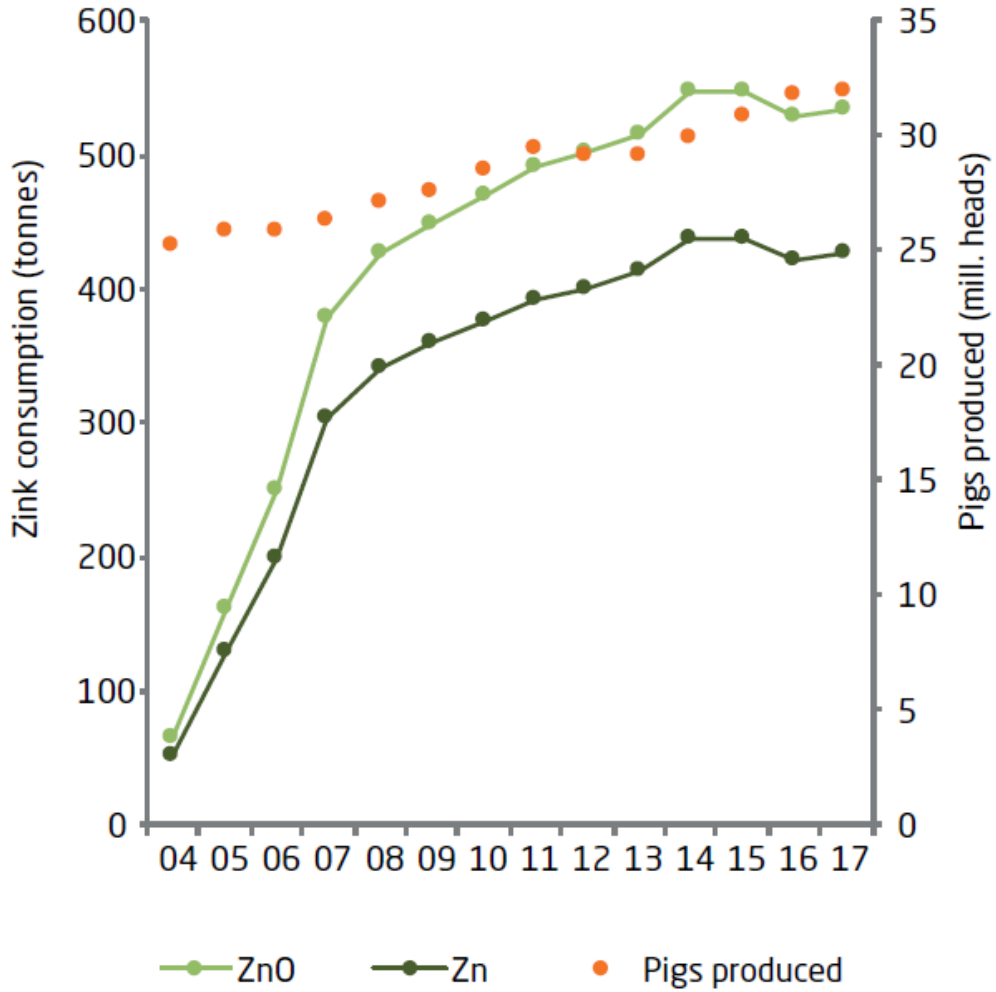
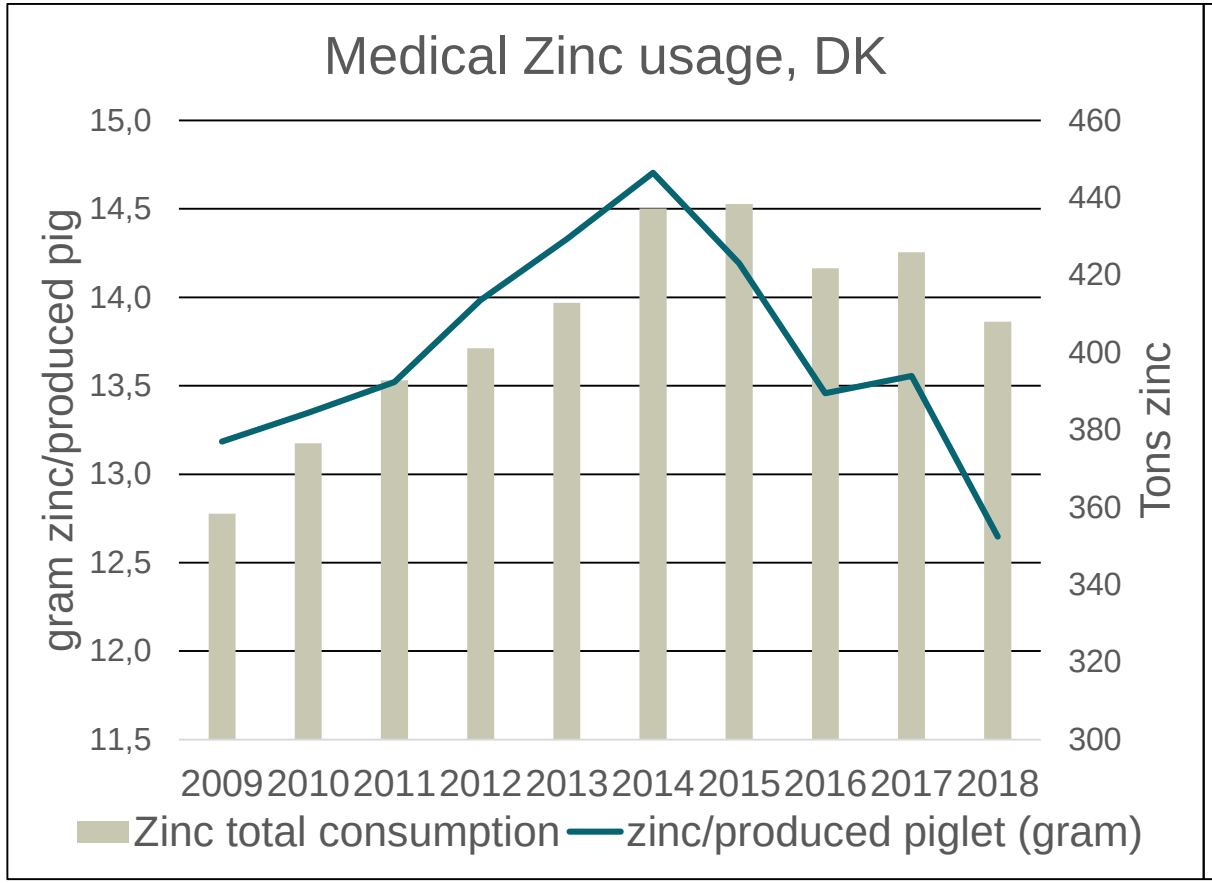
Medical use of zinc in the Danish pig production

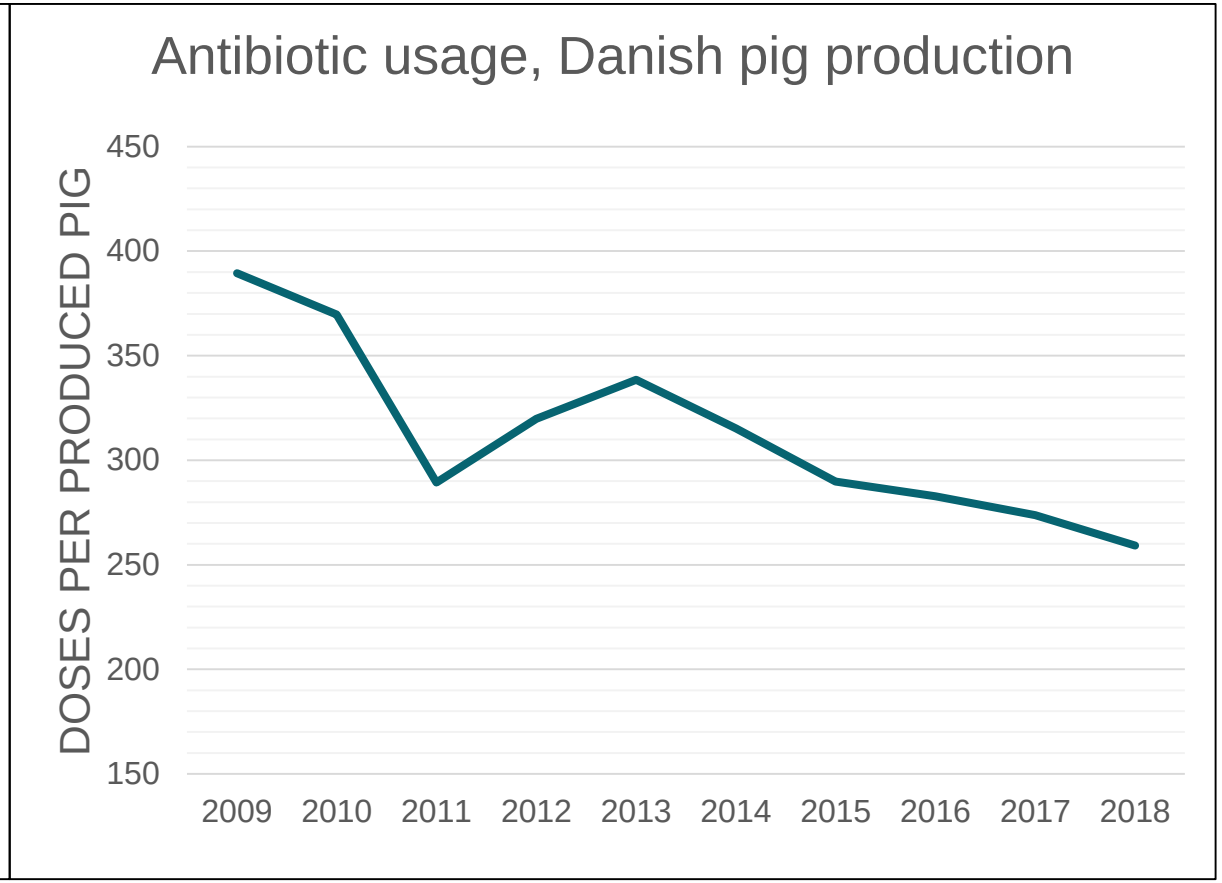
- Commonly used in weaner diets since early 90's
- 2004: Magistral ZnO allowed to control PWD – Max. level 2500 ppm Zn, requiring a prescription
- 2011: First registered ZnO product marketed
- 2014: Two additional ZnO products marketed
- June 2022: All marketed ZnO products will be withdrawn

Figure 4.6 Consumption (tonnes) of zinc oxide (ZnO) and zinc (Zn) in the pig production, Denmark DANMAP 2017



In recent years – reduction in zinc & antibiotic usage





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Reduction driven by reduced dose of medical zinc in weaner diets

SEGES trial report NO. 1101(2017):

2,500 ppm → 1,500 ppm zinc = same productivity and AB usage

Implemented on many Danish pig farms resulting in a reduction in the national use of zinc oxide*

Few farms has fully phased out the use of medical zinc

*Based on questionnairy answers & reports from the field veterinarians

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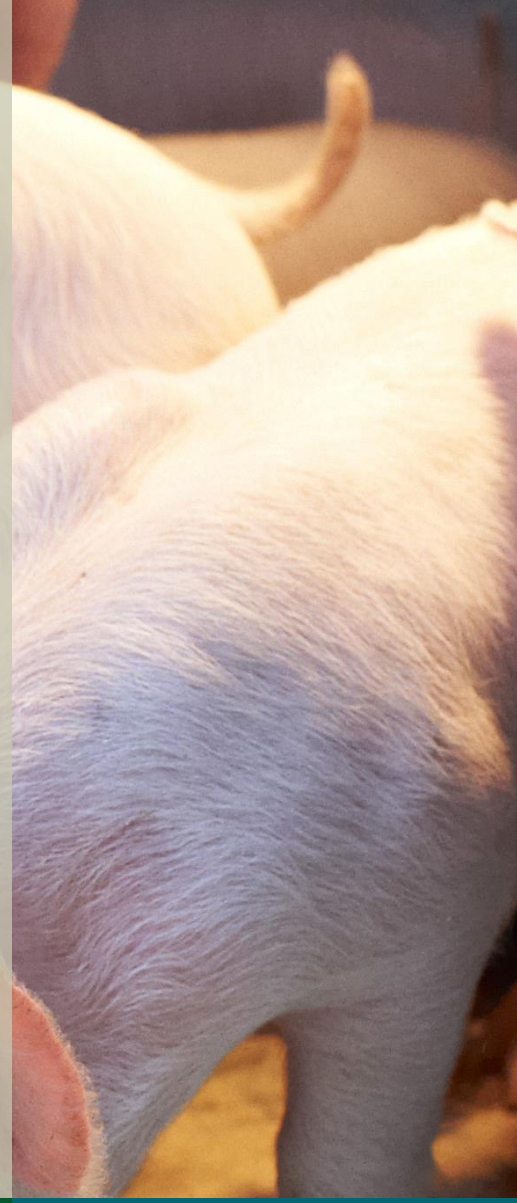
Field experiences

Weaning without medical zinc



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Danish field experiences

Purpose:
Identify common features in weaner herds with no medical use of zinc

- Herds recruited mainly through network of field veterinarians
- Herd owners interviews:
  - Management, herd health, feed, hygiene, personnel, etc.

- **Additional information**:
- Antibiotic usage - Vetstat
- Feed recipes – weaner diets
- Productivity reports
- Vaccination schemes

Results, Danish field experiences

Herd description, 26 weaner herds (600.000 weaners/year)	
Production size	**1.650-80.000** weaners per herd
Avg. lactating days	**29.4** days
Weaning weight	**5.5 – 8.5** kg
Avg. daily weight gain, 7 to 30 kg	**462** grams (nat. avg. 2018 = 462 grams 3.1%)
Avg weaner mortality	**2.1%** (nat. avg. 2018 = 3.1%)

23/26 herd has weaned pigs without medicinal zinc fore more than a year

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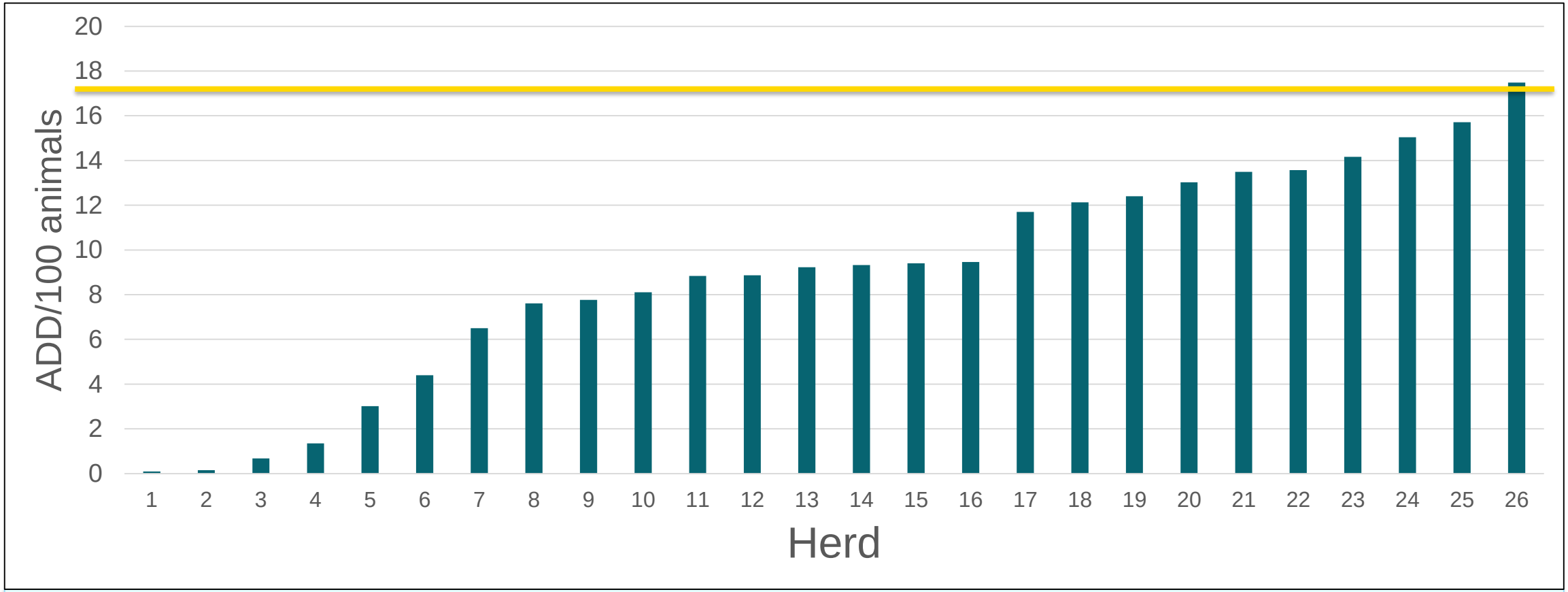
Antibiotic use, in herds weaning without use of medical zinc



Nat. avg. 2018, weaners = Approx. 10 ADD/100 animals
15/26 herds, pen level treatment the first 14 days post weaning

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Common approaches – Protein/lysine levels

Protein/lysine levels, weaner diets	min	max	average	Recommented levels
SID protein (g/FU)	113	146	135,6	144
SID Lysine (g/FU)	6,7	12	10,8	10,6
Crude protein (%)	14,8	20,5	18,8	



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Common approaches – Feed intake

Special measures to increase feed intake after weaning	# farms
Extra feeding on the floor	10
Extra feeding spaces in troughs	5
Extra drinking spaces	4
Supply with milk products	3
Gruel feed	2
Other measures	2
No special measures	2

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Common approaches – Trained personnel

Employment period:
20/26 herds: Manager of weaners employed more than a year

Experience:
18/26 herds: Manager of weaners have worked with weaners more than 3 years

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Herd specific solutions - examples

Herd A

500 sows, 34 pigs weaned/sow/year, weaning weight approx. 6,7 kg

Motivation: New herd veterinarian – focus on reduction of antibiotics & zinc

Herd specific approach: extra space in farrowing compartments, more robust pigs at weaning

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Herd specific solutions - examples

Herd B
1.400 sows, 37 pigs weaned/sow/year, weaning weight 5,5-5,8 kg
Weaner DWG 450 grams, mortality 3.5%
Motivation: Levels of zinc in slurry, no usage of unnesserary ”aids”

Herd specific approach: Strict post weaning feeding and water strategy, high health, extra space in weaner compartments

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Herd specific solutions - examples

Herd C

2.500 sows, 36 pigs weaned/sow/year weaning weight 6,0 kg

Weaner DWG 478 grams, mortality 3.5%

Motivation: Manager wants to prove he can do it!

Herd specific approach: Reduced protein and change of protein sources in weaner diets

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Controlling post weaning diarrhoea – no common solutions

Predetermining factors
Genetics
Passive immunity
Weaning age
Anorexia post-weaning

Contributing factors
Housing condition
Stocking density
Feed regimen
Co-infections

Determining factors
Toxin-producing *E. coli*

Source:
Mod. from Rhouma et. Al, 2017

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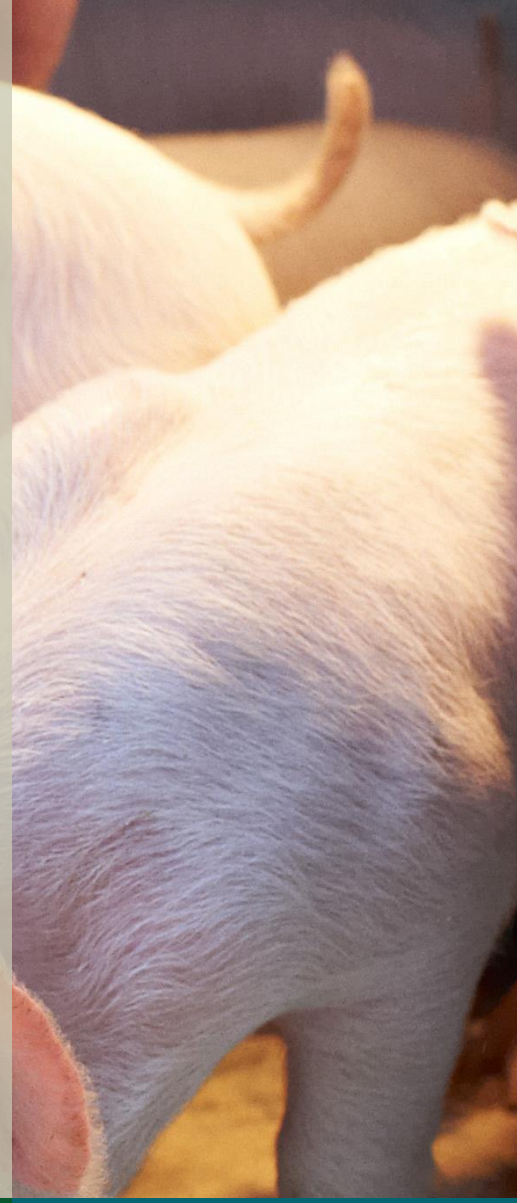
Conclusions



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Conclusions

- The goal is cost-effective solutions without increase in antibiotic use
- Not an easy task for the majority of Danish farms

- Zinc is still at common approach to control PWD in DK
- Zinc usage dropping – reduced doses is the main driver

- Farms without medical usage of zinc have:
  - Reduced protein levels in weaner diets
  - Focus on feed intake after weaning
  - Trained personnel with a longer employment period – stability

No common solutions
– each farmer need to learn what works in his/her farm!

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Thank you for your attention

Questions?

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