

# THE DANISH EXPERIENCE AFTER STOPPING THE USE OF ANTIBIOTIC GROWTH PROMOTERS

Jens Peter Nielsen  
Swine Medicine

Royal Veterinary and Agricultural University, Copenhagen, Denmark

## INTRODUCTION

The use of antibiotic growth promoters (AGP's) was definitively stopped in Danish food animal production by January 1<sup>st</sup>, 2000. This ended a period with increasing focus and discussion on the use of AGP's in relation to food safety. The discussion intensified when the AGP Avoparcin was banned in Denmark in 1995. Bacterial resistance in *Enterococcus faecium* induced by Avoparcin cause cross-resistance to Vancomycin, which is used for treatment of *E. faecium* infections in humans. It was considered likely that Vancomycin resistant *E. faecium* from food animals could enter the food chain, establish in humans, and thereby potentially cause infections, which would not respond to treatment. The actual risk of resistant *E. faecium* from animal reservoirs for human morbidity has not been established. The Danish ban was followed by an EU suspension of Avoparcin in 1997. In 1998, the AGP Virginiamycin was banned in Denmark and in 1999 in all EU member states together with the AGP's Spiramycin, Tylosin and Bacitracin.

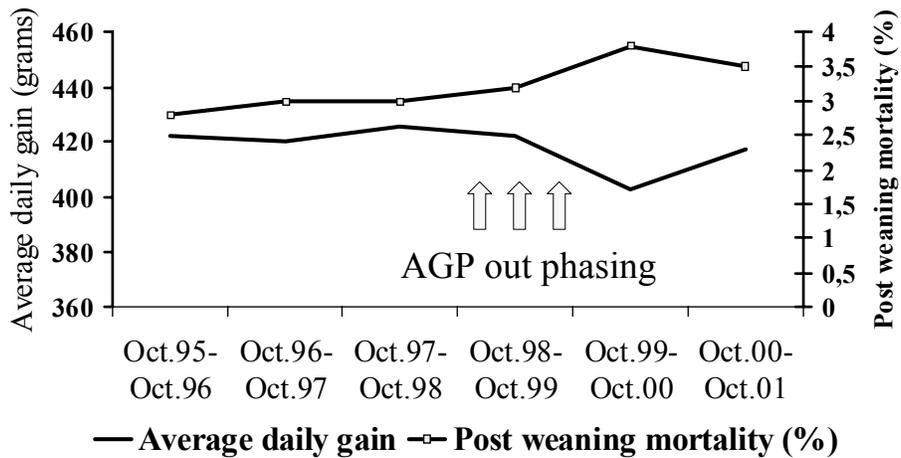
The Danish food animal industries responded to this development by voluntarily stopping the use of AGP's in cattle, poultry and finisher pigs in 1998. During 1999, AGP's were voluntarily stopped in the remaining pig production segments. An EU order to stop the use of remaining antibiotic growth promoter in all member states is expected during the autumn of 2002.

The Danish experience in the pig production sectors has shown benefits as well as drawbacks related to the discontinued use of AGP's.

## PRODUCTION AND HEALTH IN WEANER PIGS

Production results from a representative sample of Danish record-keeping herds with weaner and grower pigs (7-30 kg) appear in Figure 1. The sample size varied from 956 to 1816 herds per year. Following the voluntary phasing out of AGP's during 1999, a temporary reduction in growth rate and increase in mortality was observed. Increased prevalence of post weaning diarrhea (*E. coli*) was observed in several herds, but was generally well-controlled by management changes. Proliferative enteritis (*L. intracellularis*) also increased in many herds and is still a major clinical and sub-clinical problem. Oral medication against enteritis in weaners and growers constitutes 80% of the consumption of therapeutic antibiotics for pigs according to Vetstat figures. Vetstat is the national system in Denmark for monitoring the usage of drugs for animals.

**Figure 1. Daily weight gain and mortality in weaned pigs (7-30 kg) 1995-2001.**

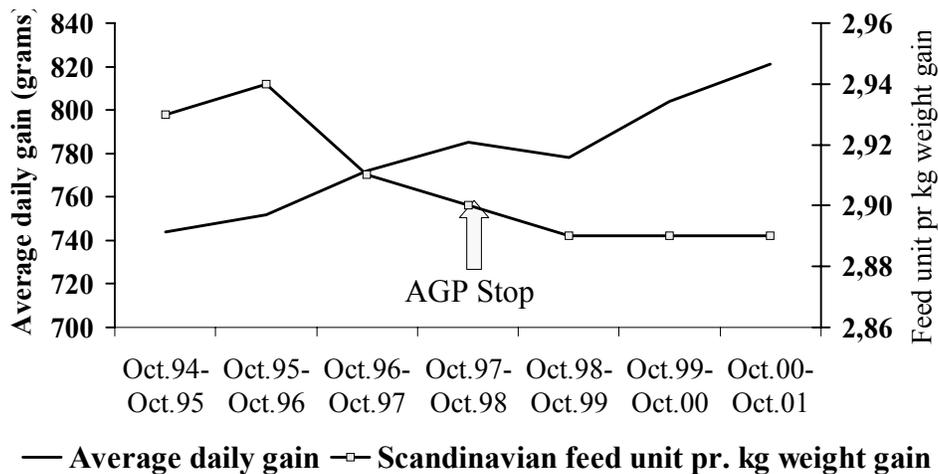


Data: National Committee for Pigs

## PRODUCTION AND HEALTH IN FINISHERS

Production results from a representative sample of Danish record-keeping herds with finisher pigs appear in Figure 2. The sample size varied from 956 to 1816 herds per year. Following the voluntary stop of AGP usage in early 1998, a slight and transient reduction in average daily growth rate was observed. No apparent effect was observed in average feed conversion ratio. Some herds experienced increased prevalence of enteritis but generally, the effects in finishers were considered insignificant.

**Figure 2. Daily weight gain and feed conversion ratio in finishing pigs (30-100 kg) 1994-2001.**

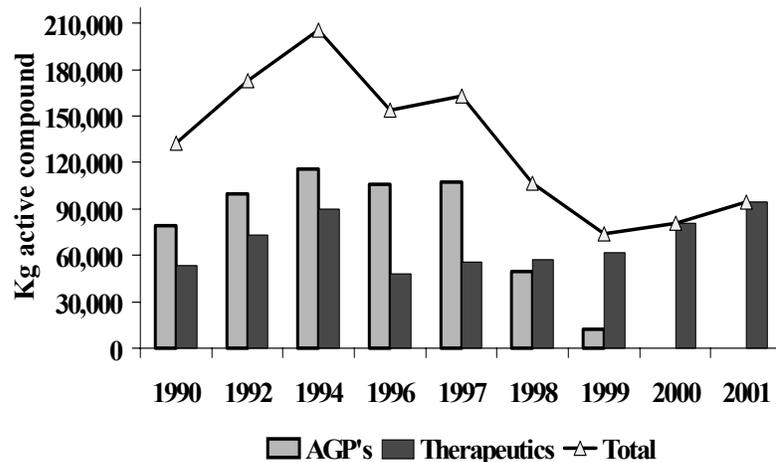


Data: National Committee for Pigs

## CONSUMPTION OF ANTIBIOTICS

Following the AGP stop an increased consumption of therapeutic antibiotics was observed (Figure 3). All therapeutic antibiotics for swine herds are prescribed by vets and bought from pharmacies. The increase was mainly due to increased use of oral medication for treatment of enteritis with tetracyclines and macrolides and is not explained by increasing national pig production. However, the total antibiotic consumption (therapeutic + AGP) is considerably lower than before the AGP stop.

**Figure 3. Consumption of antimicrobial growth promoters and veterinary therapeutic antimicrobials in Denmark 1990-2001.**



## RESISTANCE TO ANTIBIOTIC GROWTH PROMOTERS

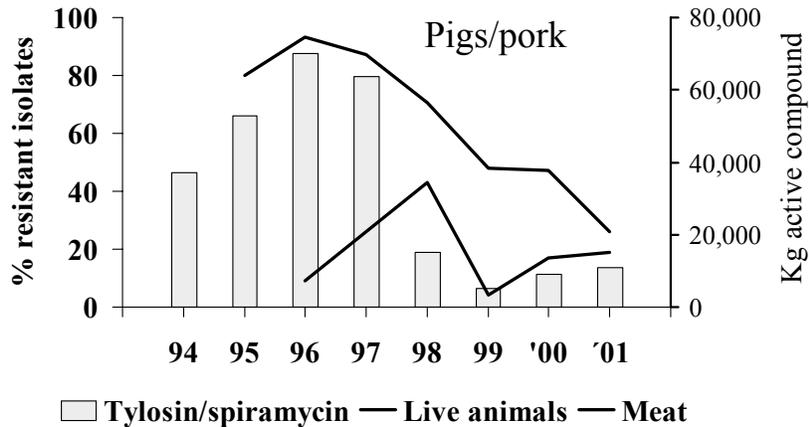
A decrease in resistance to the most commonly used AGP's was observed in bacterial isolates from animals and to a lesser extent in isolates from meat products after the AGP stop. Figures from the Danish surveillance of resistance development in animals and humans (DANMAP) are shown in Figure 4. At present no studies showing direct health-related effects in the human population due to the AGP stop have been performed.

## EFFECT ON SALMONELLA IN PIG HERDS

The prevalence of salmonella-infected pig herds has decreased further after the AGP stop. Figure 5 shows the data from the nationwide salmonella surveillance programme based on meat-juice testing for salmonella antibodies from slaughtered pigs. Level 1 herds have no or very low levels of sero-positive animals. Level 2 herds have higher levels and should seek advice. Level 3 herds have high levels and should seek advice and special precautions are carried out at the slaughter plant. Deductions in payment from slaughter plants are made for

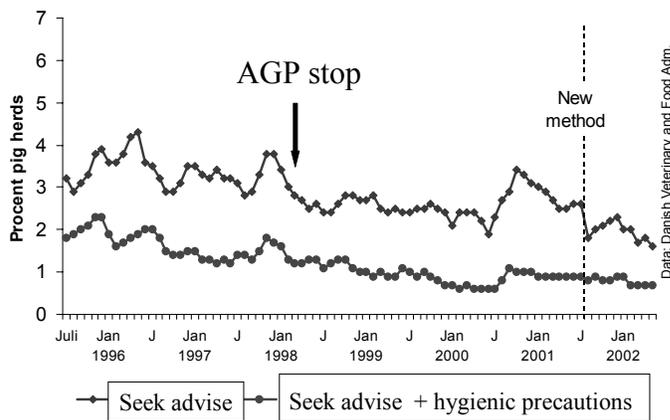
pigs delivered from level 2 and 3 herds. The cause of the sudden increase in mid-2000 is unknown.

**Figure 4. Tylosin/Spiramycin consumption and resistance to Erythromycin among E. faecium.**



Data: DANMAP

**Figure 5. Salmonella surveillance in Danish finisher herds (1996-2001).**



## CONCLUSIONS

Experiences during the last two years have shown that a profitable intensive pig production was possible without using AGP's. However, significant effects on health and productivity in weaner pigs have been observed. An increased consumption of therapeutic antibiotics has been observed, and the major challenge for the next years will be a further focus to disease control by prophylactic measures and risk factor reduction as opposed to disease control by

medication. When medication is necessary, it should be targeted to diseased animals only e.g. animals transferred to isolated hospital pens.

As expected antibiotic resistance in bacteria of animal origin was reduced in parallel with reduced use of antibiotics. The implication of this reduction for human health needs further studies.

## **ACKNOWLEDGEMENTS**

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