

## ANTIMICROBIAL GROWTH PROMOTERS

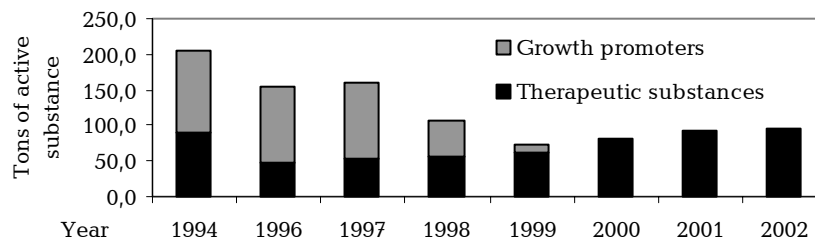
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Antimicrobial growth promoters were formerly added to feed for food animals to achieve faster growth. Antimicrobial growth promoters are a hazard for humans, either because of resistance in bacteria that are spread from animals to humans or by transfer of resistance genes to human pathogenic bacteria. Avoparcin, tylosin, spiramycin, virginiamycin and avilamycin were among the most commonly used growth promoters. Avoparcin is a glycopeptide; resistance leads to cross-resistance to vancomycin. Tylosin and spiramycin are macrolides, and virginiamycin is a streptogramin; substances that represent classes of antimicrobials that are also used in human medicine. Denmark began to phase out the growth promoter avoparcin in 1995, and in 2000 the use of all antimicrobial growth promoters were banned after a voluntary decision by the industry. During the Danish chairmanship of the EU, it was decided that antimicrobial growth promoters should be prohibited the EU from 2006.

### Danish experiences after cessation

A WHO panel of experts has recently evaluated Danish experiences. The report reviews (1) the total consumption of antimicrobials in agriculture, (2) occurrence of resistance in bacteria isolated from animals, foodstuffs and humans, (3) the occurrence of food-borne bacterial infections, (4) effect on the surrounding environment, (5) the welfare of the production animals, and (6) economic effects of the ban. After cessation, the total consumption of antimicrobials in agriculture has fallen by 54%; from 206 tons in 1994 to 94 tons in 2001, *fig. 1*. Pork and slaughter chickens, which were formerly exposed to antimicrobials throughout the whole of their lives, are now exposed for an average of 7.9 and 0.4 days, respectively, until they reach slaughtering weight. In parallel with the phasing-out of the antimicrobial growth promoters, a fall in resistance among bacteria from production animals has been observed. This means that the total reservoir of resistant bacteria that can be transferred from animals to humans through the food chain has been reduced. It has been argued that the cessation of antimicrobial growth promoters could lead to an increased occurrence of zoonotic bacteria such as salmonella and campylobacter, including an increased occurrence of resistance

**Fig. 1. Consumption of antimicrobial growth promoters and therapeutic antimicrobials in Danish agriculture, 1994-2002 (tons of active substance)**



among these. However, there is no evidence to suggest that this has been the case, EPI-NEWS 9/03. In pork production, a rise in the use of certain therapeutic antimicrobials was recorded in 2001. WHO's panel of experts judges that these circumstances are primarily due to adjustment problems. The total productivity in the pork industry has risen during the period, and in 2002 a further rise in the use of tetracycline for piglets has not been recorded. The phasing-out of growth promoters in slaughter poultry has taken place without significant problems as regards economics or animal welfare.

### Perspective

With this report, the WHO acknowledges the Danish ban by recommending that growth promoters can and ought to be removed from agriculture in countries where production conditions resemble those in Denmark. WHO's recommendation is directed in part towards the United States. American and Danish pork and chicken production are modern and intensive, and the report is an argument to phase out growth promoters in the United States and other industrialised countries as well. The WHO panel's report may be obtained from Danish Veterinary Institute or at [www.who.int/salmsurv/links/gssamrgrowthreportstory/en/](http://www.who.int/salmsurv/links/gssamrgrowthreportstory/en/) (K. Mølbak, Dept. of Epidemiology, A. M. Hammerum, AAS, H. C. Wegener, Danish Zoonosis Centre)

### DANISH CASES OF TULARAEMIA

In July 2003, an 8-year-old boy who had presumably been bitten the day before on the island of Fur, had a tick removed from the left buttock. Three days later, he developed high fever, with generalised pains, swelling and flushing in the groin and the site of the bite. On suspicion of borreliosis, he received penicillin, but without effect. On the sixth day, he was changed to Dicloclil®, on suspicion of staphylococcal infection. By the tenth day, he still had fever.

The redness and glandular swelling in the groin had increased, and the bite wound was 1 cm in diameter. On the 15th day, the diagnosis of tularaemia was suggested, and he received gentamycin, with good effect. On the 22nd day, a tularaemia agglutination test was positive and the day after, molecular biological analysis of inguinal gland tissue was performed. Broad-range PCR and sequencing were consistent with *Francisella tularensis*, and two species-specific PCR reactions were also positive. On culture of the gland, *F. tularensis* was detected after seven days. Histological examination showed necrotising granulomatous infection consistent with tularaemia. This is the first Danish case of tularaemia ("rabbit fever") verified by culture and PCR. Cases of presumed tularaemia have previously been reported, diagnosed by serology and/or pathology, EPI-NEWS 23/01. *F. tularensis* is transmitted by several routes, including contact with infected hares, mice, squirrels, etc. In Sweden, infection is usually transmitted by mosquitoes, but also by deerflies and ticks or by inhalation of hay dust. In central Sweden this year, >300 cases of *F. tularensis* biovar palaeartica have been reported. This strain is significantly less pathogenic than biovar tularensis, which is found in North America. Specimens for diagnostics are sent by mail as ordinary bacteriological specimens, with information about clinic and any foreign travel. (S. Böcher, B. Hertz, J. Prag, Viborg Hospital, K. Andresen, P. Schiellerup, J. J. Christensen, Division of Microbiology and Diagnostics, SSI)

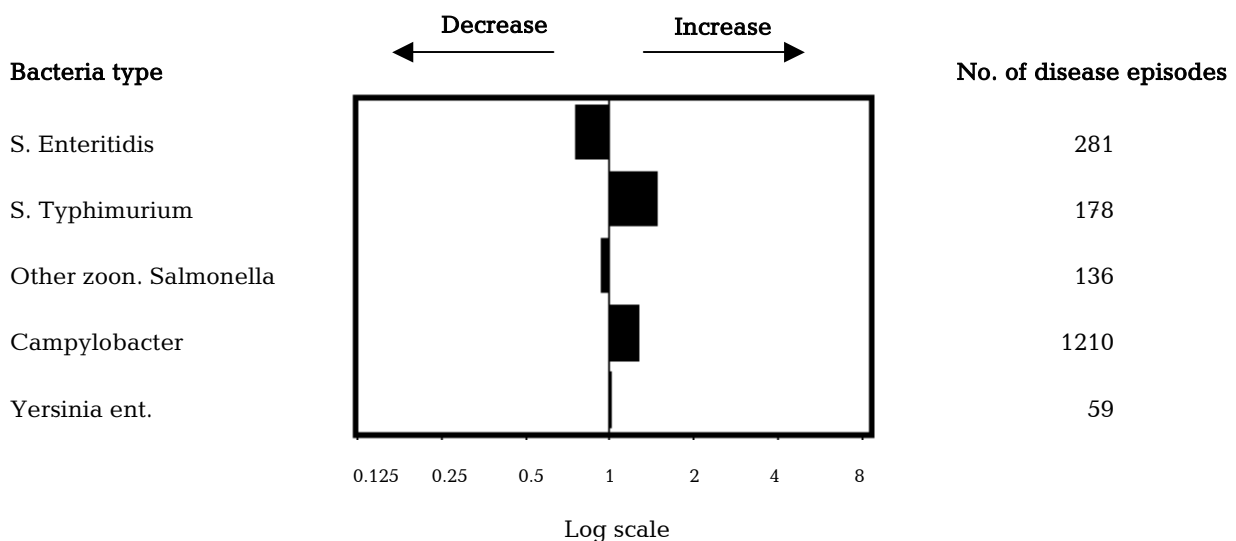
### THE DANISH CHILDHOOD VACCINATION PROGRAMME - 2003

The new edition may be obtained without charge from the Danish National Board of Health's publications department, by phone: +45 70262636, or e-mail: [sundhed@schultz.dk](mailto:sundhed@schultz.dk).

## Patients with positive culture of pathogenic intestinal bacteria, July-August 2003

County	S. Enteritidis		S. Typhimurium		Other zoon. Salmonella		Campylobacter		Yersinia ent.	
	July	August	July	August	July	August	July	August	July	August
Copenhagen Munic.	11	14	3	11	15	13	44	62	1	2
Frederiksberg Munic.	-	4	-	2	-	-	4	4	-	-
Copenhagen	11	12	5	11	8	9	52	59	4	-
Frederiksborg	17	7	8	11	5	4	34	28	1	3
Roskilde	3	2	2	6	1	3	21	27	1	3
West Zealand	1	3	5	5	4	4	26	20	1	1
Storstrøm	4	10	7	11	1	4	22	37	2	3
Bornholm	2	1	-	-	-	1	11	1	-	-
Funen	28	22	8	10	3	3	71	70	1	4
South Jutland	6	5	5	3	3	3	29	26	-	-
Ribe	9	9	-	5	1	2	35	28	2	4
Vejle	4	9	6	7	3	3	49	66	-	2
Ringkøbing	9	8	3	8	5	2	37	35	6	4
Aarhus	23	10	3	8	8	6	61	92	4	3
Viborg	7	3	3	7	6	4	31	29	-	1
North Jutland	11	16	4	11	3	8	60	38	2	4
Unknown	-	-	-	-	-	1	1	-	-	-
DK July/Aug 2003	146	135	62	116	66	70	588	622	25	34
DK July/Aug 2002	170	204	57	78	88	95	683	826	19	37

## Barometer for pathogenic intestinal bacteria, July-August 2003



The barometer shows number of disease episodes in the two relevant months compared with the average of 15 two-month periods in the last five years. Further surveillance data may be obtained at [www.germ.dk](http://www.germ.dk).