



# 抗生素使用的减少 REDUCED ANTIBIOTIC USAGE

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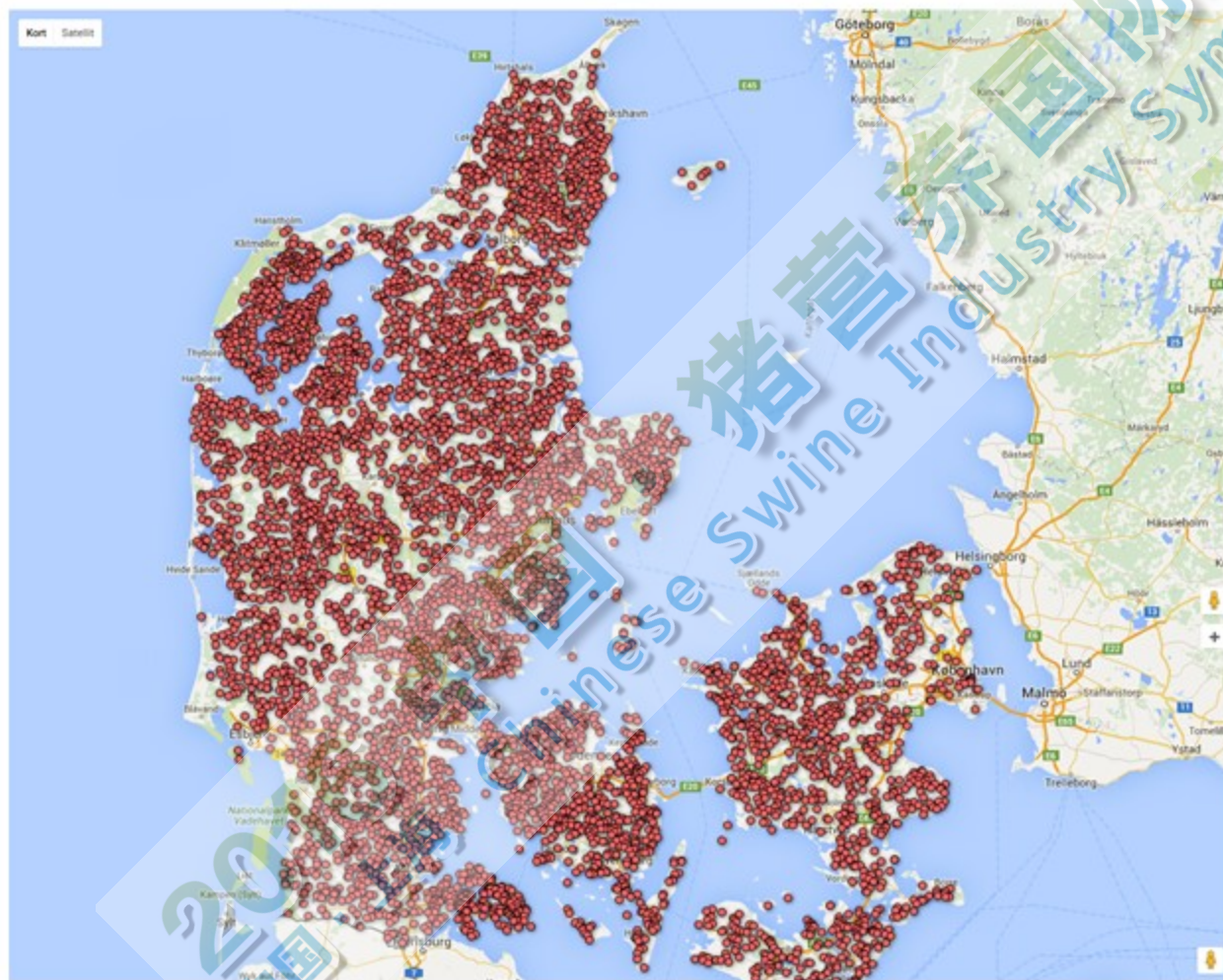
- SEGES: 1985 to 2016
- **一般繁殖 General reproduction**
  - 人工授精 Artificial insemination
  - 产仔数 Litter size
  - 夭折 Abortion
  - 妊娠诊断 Pregnancy diagnosis
- **繁殖传染病**  
**Infectious diseases in reproduction**
- **仔猪死亡率 Piglet mortality**
  - 产仔 Farrowing
  - 哺乳期 Lactation
  - 较高的断奶体重 High weaning weight



丹麦 DENMARK

600万人口 6 MILLION PEOPLE

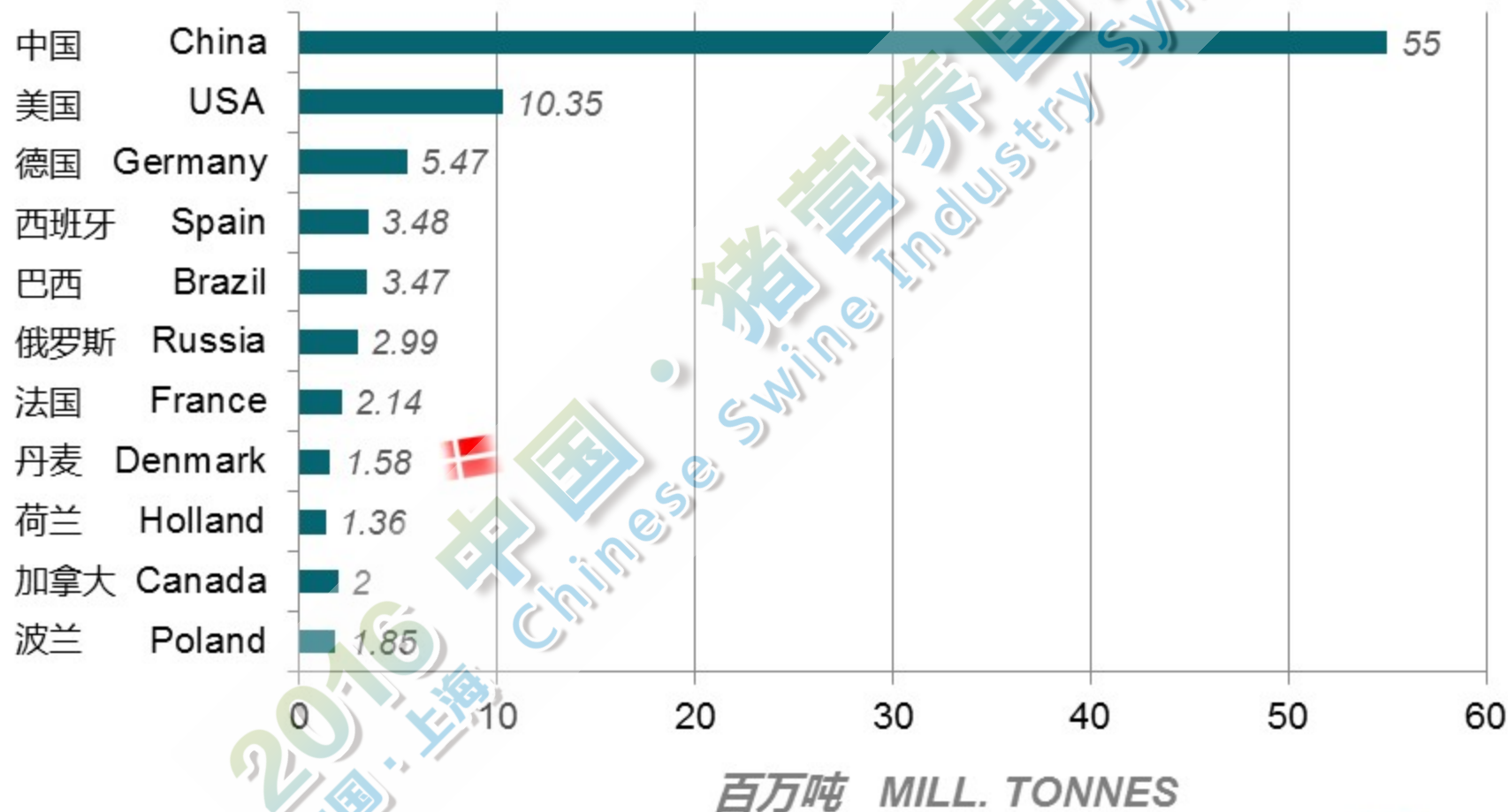
90万头母猪 900.000 SOWS 3500万头猪/年 35 MILLION PIGS/YEAR



# 世界不同国家猪肉产量

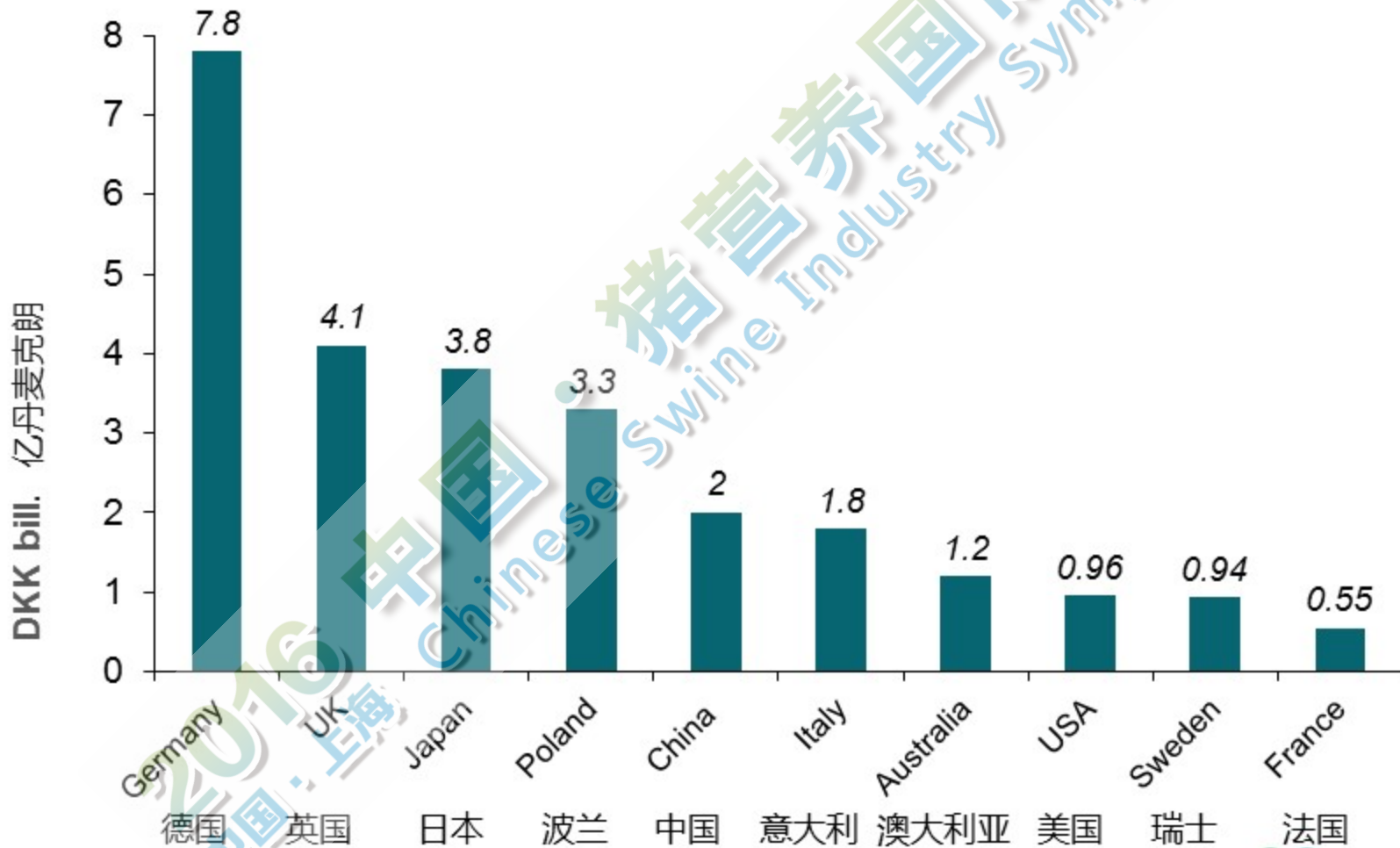
## WORLD PIGMEAT PRODUCTION IN SELECTED COUNTRIES (2014)

(百万吨 MILL. TONNES)



# 丹麦猪肉出口额前10名国家

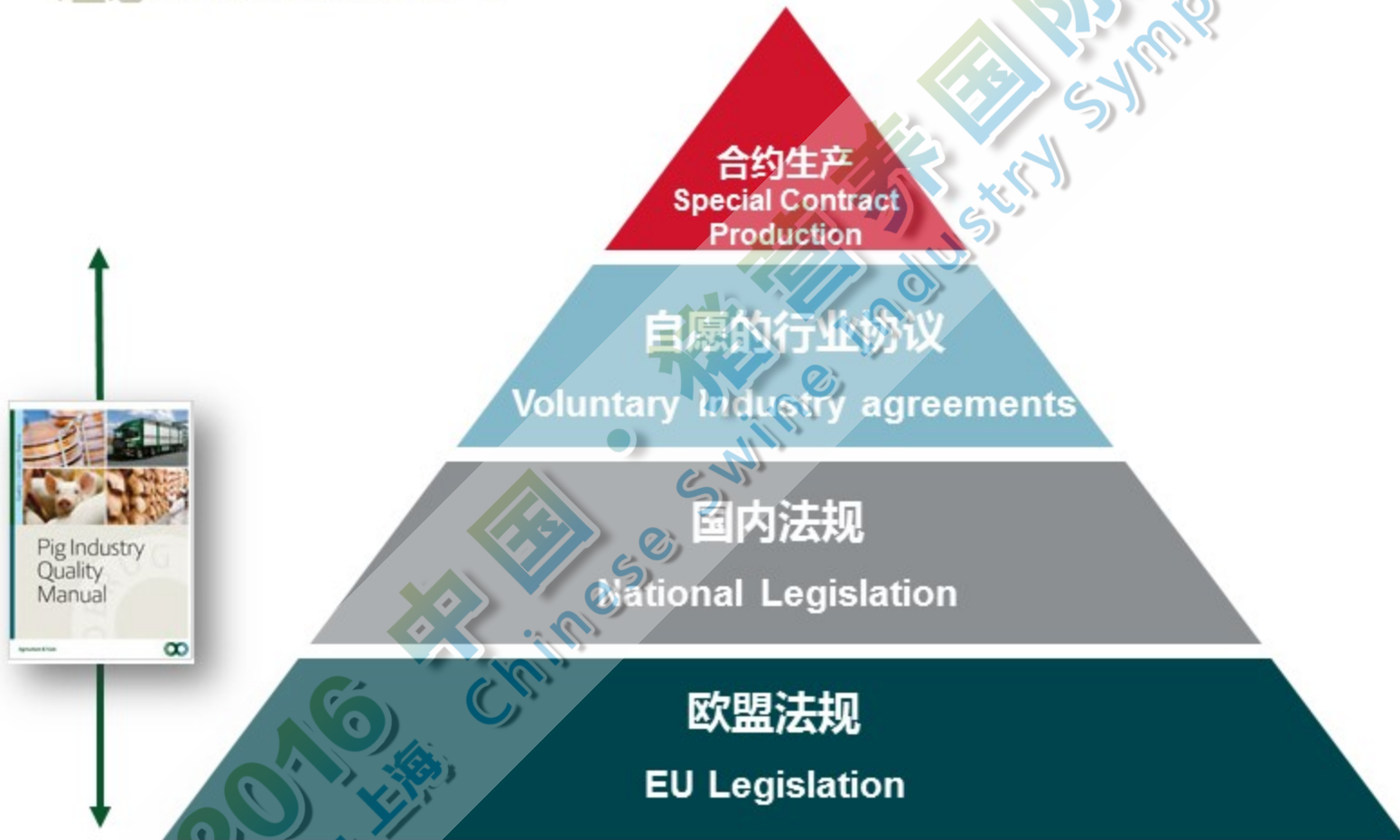
## DANISH PIGMEAT EXPORTS TOP 10 BY VALUE (2014)



# 丹麦质量体系

# DANISH QUALITY SYSTEM

理念 THE CONCEPT



# 丹麦合作社运营的益处

## BENEFITS OF THE CO-OPERATIVE SYSTEM IN DENMARK

- 农场利益来源不仅仅是养猪 Commercial interest of producers “beyond the farm gate”
  - 农场合营自有屠宰场 Producers own the cooperative abattoir
- 农场和屠宰场互信的稳定关系 Trust/stable relationship between producer and abattoir
  - 合作社所有权 Cooperative ownership
- 联合研究计划 Joint Research Programmes
  - Seges, 大学 Seges, universities
- 卓越的交流和信息共享体系 Excellent communication, information flow
  - 受过良好教育的养猪户、技工、兽医和生产顾问  
Well educated pig producers, skilled staff, motivated veterinarians and production advisers
- 对于改进质量的措施接受较为容易 Easy assimilation of quality initiatives
  - 信息技术 Information technology
- 低交易成本 Low transaction costs



“一条龙” 生产系统 INTEGRATED PRODUCTION SYSTEM

## 拜访丹麦养猪业后，欧盟2016年有关抗生素的报告指出： FROM AN EU REPORT ON ANTIBIOTICS 2016 AFTER VISITING DANISH PIG PRODUCTIONS

丹麦采取的多种鼓励谨慎使用抗生素的综合措施，以有效解决抗生素耐药性等更广泛的问题，这可以给其他成员国作为一个有效解决抗生素问题的实例。

*Various aspects of the comprehensive measures put in place in Denmark aimed at encouraging the prudent use of antimicrobials in animals and tackling the broader issue of antimicrobial resistance, could serve as an illustration of potential good practices to other Member States.*

总之 *In short:*

**丹麦所采取的措施应在其他欧盟国家推广使用。**

**What Denmark does should be extended to other EU countries**

来源 Source:

[https://www.foedevarestyrelsen.dk/SiteCollectionDocuments/Pressemeddelelser/2016/Final\\_Report\\_EU-Kommissionen\\_2016\\_USE\\_OF\\_ANTIMICROBIALS\\_IN\\_ANIMALS.pdf](https://www.foedevarestyrelsen.dk/SiteCollectionDocuments/Pressemeddelelser/2016/Final_Report_EU-Kommissionen_2016_USE_OF_ANTIMICROBIALS_IN_ANIMALS.pdf)





猪业国际论坛  
Swine Industry Symposium

2016 中国  
中国·上海 Chinese Swine Industry Symposium



# 丹麦方法 1

## THE DANISH WAY 1

- **谨慎使用抗生素的传统**  
Long tradition for judicious use of antibiotics
- **农场主仅能凭处方购买抗生素**  
Producers can only buy antibiotics with a prescription
- **1968年丹麦实施SPF体系**  
Denmark implemented the SPF system from 1968
  - **无特异病原**  
Specific Pathogen Free
- **从1994年开始兽医不再售卖抗生素，他们给药房开处方**  
Veterinarians do not sell antibiotics since 1994. They make the prescriptions to the pharmacy
- **1996年丹麦发布抗生素消费和耐药性报告**  
Since 1996 annual DanMap reports of antibiotic consumption and resistance
- **1998年丹麦养猪协会停止在育肥饲料中使用抗生素生长促进剂**  
In 1998 the Danish Pig Industry ceased the use of antibiotic growth promoters in finisher feed
- **2000年丹麦养猪协会停止在所有猪饲料中使用抗生素生长促进剂**  
In 2000 the Danish Pig Industry ceased the use of antibiotic growth promoters in all pig feed
  - **2006年所有欧盟成员国也禁止使用**  
Followed in 2006 by all EU members

## 丹麦方法 2

### THE DANISH WAY 2

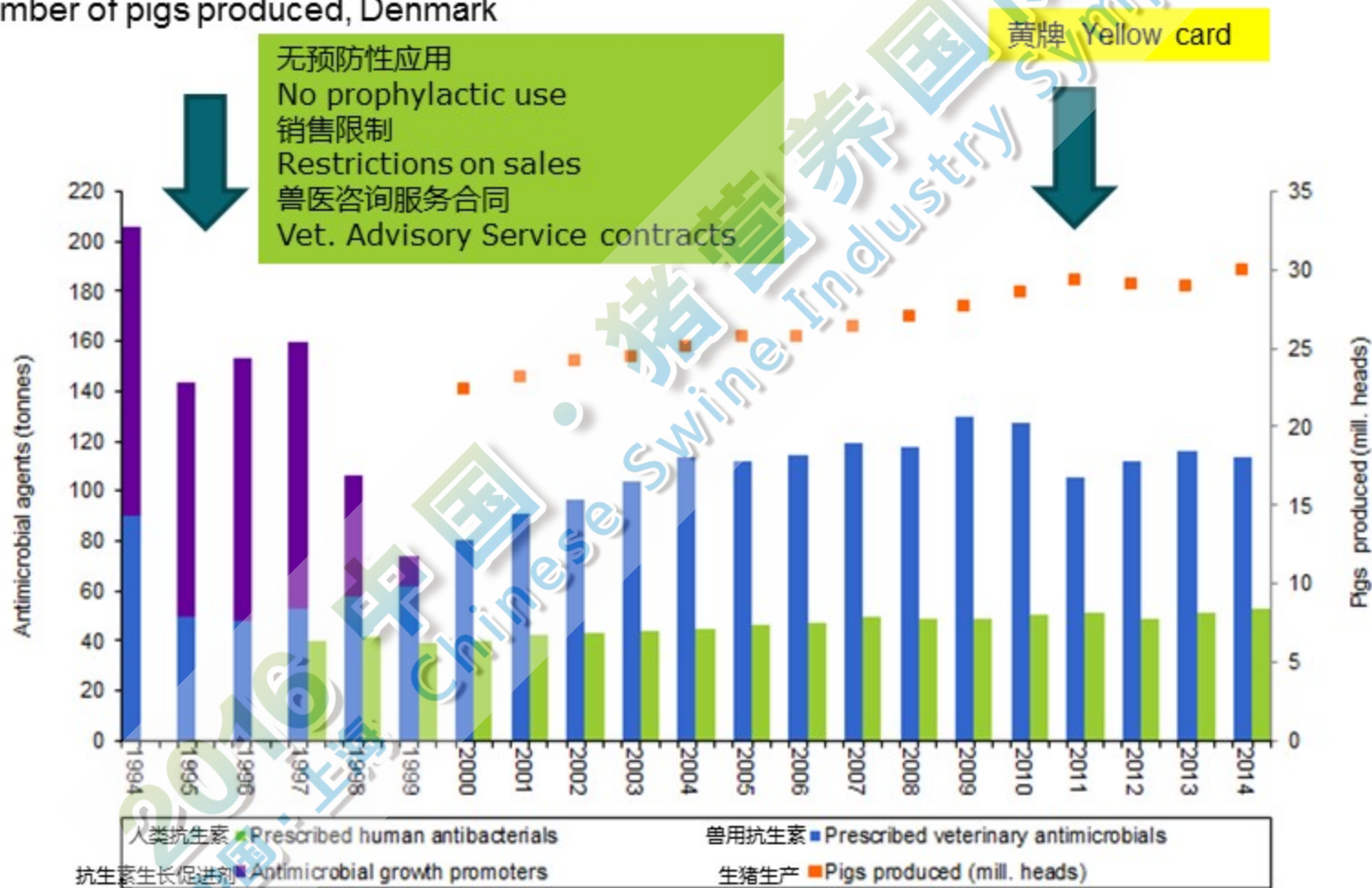
- **2000年起VETSET登记所有农场和兽医的抗生素用量**  
Since 2000 VETSTAT register all antibiotic consumption at farm and at veterinarian level
- **2002年丹麦养猪协会停止对猪使用氟喹诺酮类药物，为人类使用**  
2002. Danish Pig Industry ceased the use of fluoroquinolones for pigs, to reserve these for humans
- **2005年丹麦养猪协会和政府当局列出了所有相关在猪上使用或禁止使用抗生素，并进行排名**  
Since 2005 Danish Pig Industry and the authorities list rate all relevant antibiotics to be used or restricted in use for pigs
- **2010年丹麦养猪协会停止对猪使用头孢菌素类药物，为人类使用**  
2010. Danish Pig Industry ceased the use of cephalosporins for pigs, to reserve these for humans
- **2010年丹麦当局出台每头动物抗生素使用的限制量，“黄牌”。**  
2010. Danish authorities imposed limits in antibiotic use per animal. "Yellow Card"

# 丹麦1990-2014的抗生素用量

## Antimicrobial consumption in Denmark 1990-2014

图4.1 丹麦 抗生素对人类、动物、生猪生产额的应用对比

Figure 4.1. Prescribed antimicrobial agents for humans, and for animals compared with the number of pigs produced, Denmark



# 黄牌 YELLOW CARD 最后的警告 THE LAST WARNING



COURTESY OF - ELISABETH OKHOLM  
NIELSEN, DVM, DENMARK

# 黄牌

## YELLOW CARD

- **各个农场和年龄段抗生素的用量**  
Antibiotic consumption per farm and age group
  - 按特定的年龄段出抗生素处方  
Antibiotics are prescribed to a specific age group
  - 从药房处收集处方抗生素用量  
Amounts prescribed are collected from the pharmacy
- **各年龄段和农场的动物数量**  
Number of animals per age group and farm
  - 由政府当局备案 Is recorded by the authorities
  - 农场主在线注册 Registered by the producer online
- **各个年龄段的特定限制**  
A specific limit per age group
  - 母猪和仔猪 Sows with piglets
  - 断奶仔猪 Weaners
  - 育肥猪 Finishers
- **如果抗生素用量过高，农场主有9个月的时间降低抗生素用量**  
If too high antibiotic consumption, producers have 9 months to reduce the consumption
- **如果仍然超过规定用量，农场主将支付额外的兽医咨询费**  
If still above, producers will pay for extra veterinary advice

# 2005年首次与生猪生产相关的抗生素评价

## RATING OF RELEVANT ANTIBIOTICS FOR PIG PRODUCTION. FIRST TIME IN 2005.

- 绿色**代表推荐用于特定疾病和细菌的抗生素。绿标签的抗菌剂敏感性在80%以上，有良好的药物动力学和人体健康结果的风险分析，评估没有或仅有很低的结果，最好也有能够作为临床疗效的证明文件。用于四类特定疾病和病原体排名的绿标签抗生素举例有普鲁卡因青霉素、泰妙菌素、沃尼妙林和硫酸粘菌素。

**Green** indicates antimicrobials that are recommended to be used for that specific disease and pathogen combination. The green-labelled antimicrobials will have susceptibility above 80%, good pharmacokinetics and a risk profiling of human health consequences assessed to have no or only low consequences and preferably also evidence based documentation of clinical efficacy. Examples of green-labelled antimicrobials with good ranking in all four categories for specific diseases and pathogens are: benzylpenicillinprocain, tiamulin, valnemulin and colistin sulfas.

**黄牌**代表可使用的抗生素，但有更好的选择。

**Yellow** indicates antimicrobials that can be used, but better alternatives are available.

**红牌**代表因高的人类健康结果或低敏感性而不推荐使用的抗生素。红标签的抗生素药品举例有恩氟沙星、麻保沙星、头孢喹肟和其它头孢菌素类药物，但是也有一些敏感度低的特定病原体的抗生素会被贴红标签。

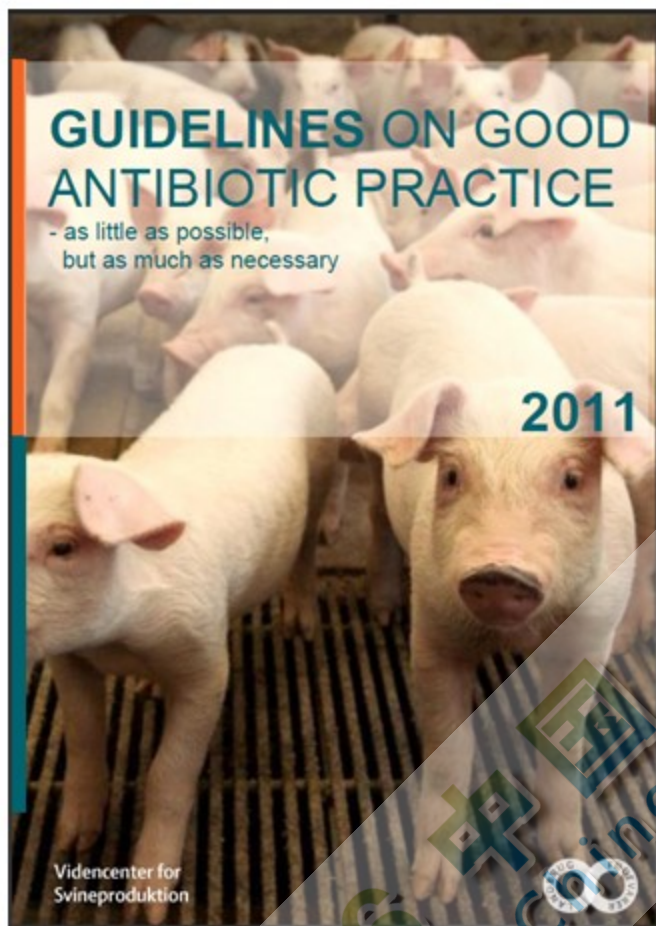
**Red** indicates antimicrobials not recommended due to high human health consequence or a very low susceptibility. Examples of red-labelled antimicrobials are enrofloxacin, marbofloxacin, cefquinom and other cephalosporins, but also other antimicrobials with a low score on susceptibility for a specific pathogen will be labelled with a red colour.

### 行业、大学与政府当局的合作

Collaboration between industry, universities and authorities

# SEGES生猪产业指南

## PIG INDUSTRY GUIDELINES FROM SEGES



**抗生素：尽量少用，要用就要用足。**  
**Antibiotics: As little as possible, but as much as necessary**

- 英语 English
- 丹麦语 Danish
- 俄语 Russian

[vsp.lf.dk](http://vsp.lf.dk)

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**Link to Smartphone:**





# 结论 1

## CONCLUSIONS 1

- **在发达的生猪产业国家中，丹麦抗生素用量明显较低**  
Among countries with a high pig production, Denmark has a significantly low consumption of antibiotics
- **这是从农场主开始推动的结果**  
This is driven from a farmer perspective
- **政府当局在抗生素用量上有深刻的见解，并遵循耐药性发展的客观规律**  
Authorities has deep insight in the consumption and follows the development of resistant bacteria
- **关注健康对减少抗生素用量很重要**  
Focus on health is important for a low consumption
  - 无特异病原体系 Specific Pathogen Free system
  - 生产隔离 Segregation of production
  - 接种疫苗 Vaccinations
  - 有效的取暖通风 Efficient heating and ventilation
  - 高质量饲料 Good quality feed

## 结论 2

## CONCLUSIONS 2

- **精确的诊断很重要** An exact diagnosis is important
  - **正确治疗感染** Treating the correct infection
    - **腹泻**：大肠杆菌、胞内劳森是菌、肠道螺旋体、艾美尔球虫等  
Diarrhea: Escherichia coli, Lawsonia intracellularis, Brachyspira pilosicoli, Coccidia, .....
    - **肺炎**：放线杆菌、流感、支原体等  
Pneumonia: Actinobacillus, influenza, mycoplasma, .....
  - **正确使用抗生素** Using the right antibiotic
    - **治疗前进行相关抗生素的过敏性测试**  
Testing sensibility to relevant antibiotics before treatment
- **采用单次注射，不用在饲料中**  
Use single injections and not in-feed medication
- **治疗的正确时间** Treating at correct time
- **使用相关的疫苗** Use relevant vaccines available
- **根除兽群感染** Eradicate the infection from the herd
  - **通过SPF体系控制猪短螺旋体性痢疾、放线杆菌和支原体。**  
Brachyspira hyodysenteria, Actinobacillus and Mycoplasma are controlled by the SPF system

# 丹麦人做了什么？ WHAT DID THE DANES DO?

清洁、干燥、  
温暖的猪舍

Clean, dry  
warm  
facilities

水

Water

合适的饲料

Right feed

必要的抗生素

Antimicrobials  
when needed