Managing Respiratory Disease
牛呼吸道疾病（BRD）的管理

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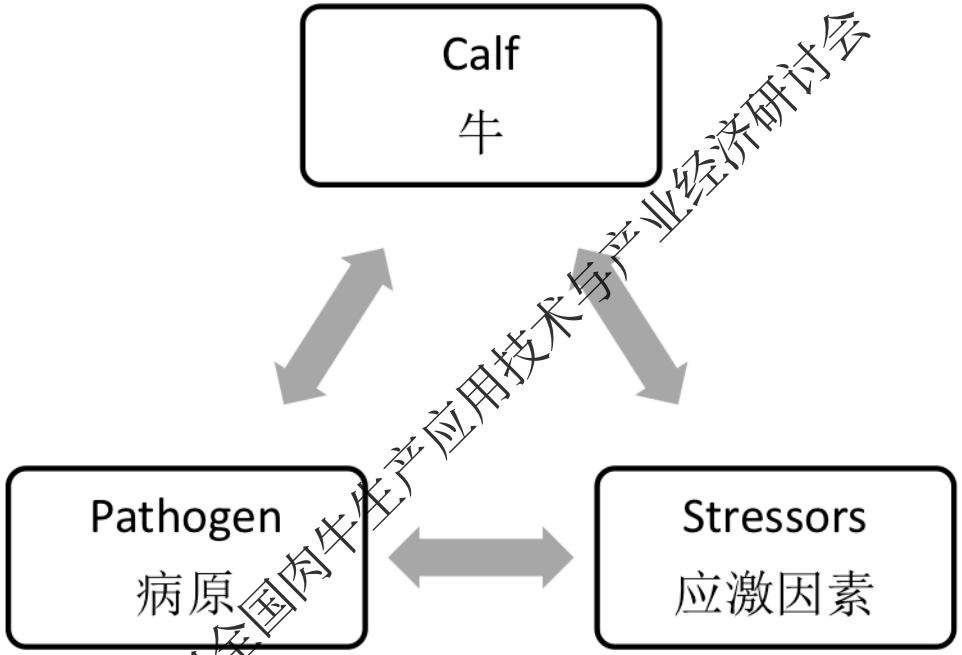
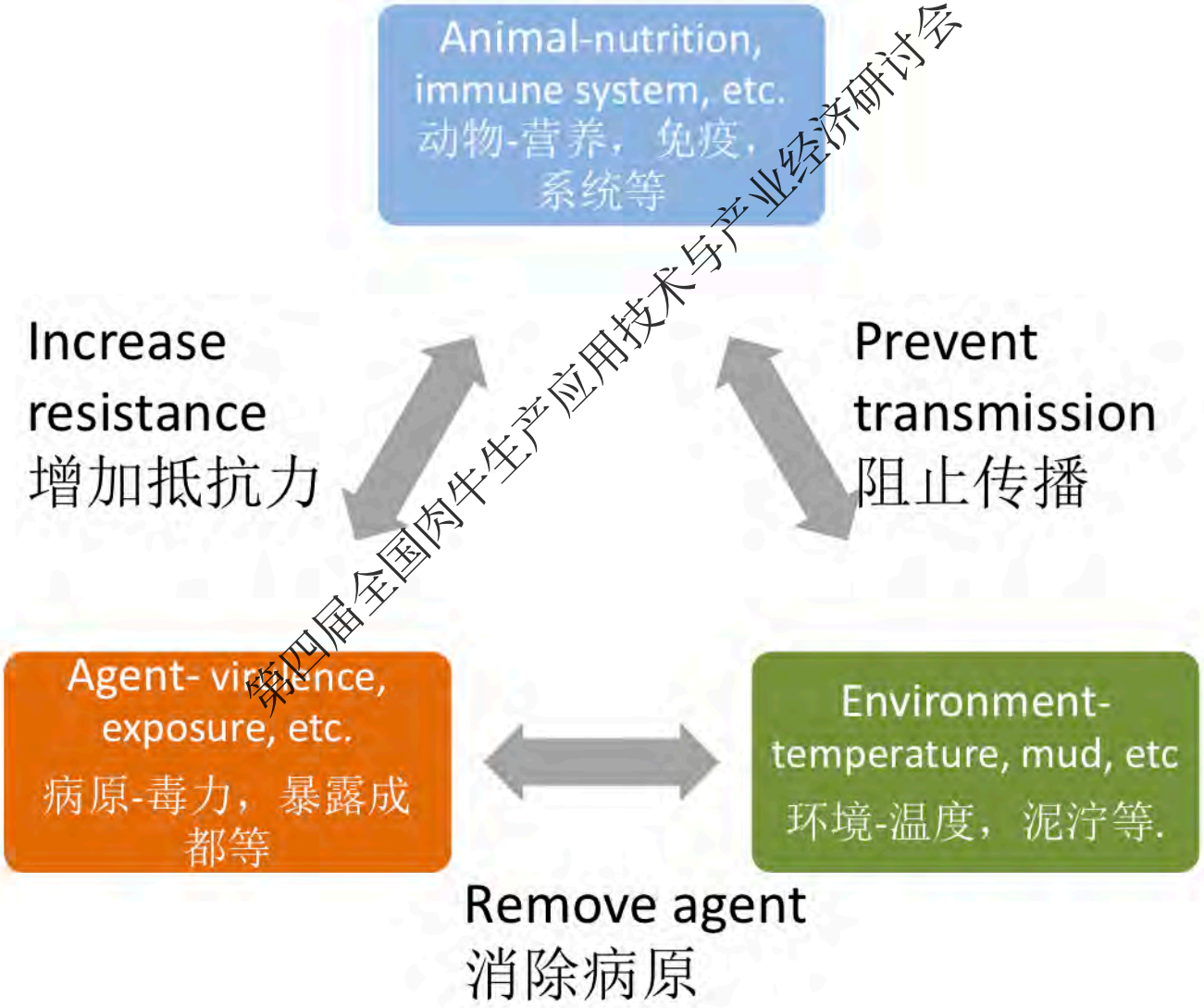
BRD

- Pneumonia.
- 肺炎
- Bronchial pneumonia.
- 支气管肺炎
- Fibrinous pleuropneumonia.
  纤维性胸膜肺炎
- Shipping fever
- 运输热

Bovine Respiratory Disease Complex
呼吸道疾病综合征



Disease prevention
疾病预防



Why Animals Get Sick
为什么动物会生病

Disease Challenge
疾病挑战

Host Resistance 抵抗力

- **Innate immunity**先天免疫
- **Active immunity**主动免疫
- **Passive immunity**被动免疫
- **Antibiotics**抗生素

HEA
健

What costs the cattle industry
4 billion dollars annually?
是什么每年对牛业造成40亿美元
的损失？

Bovine Respiratory Disease
呼吸道疾病

Reduces performance降低生产性能

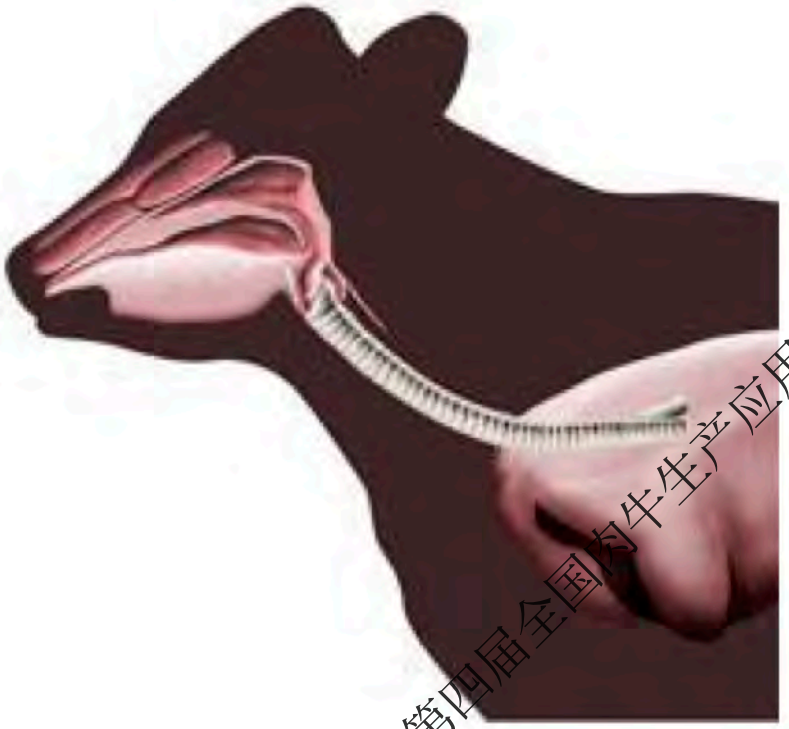
Cost of calves…犊牛损失

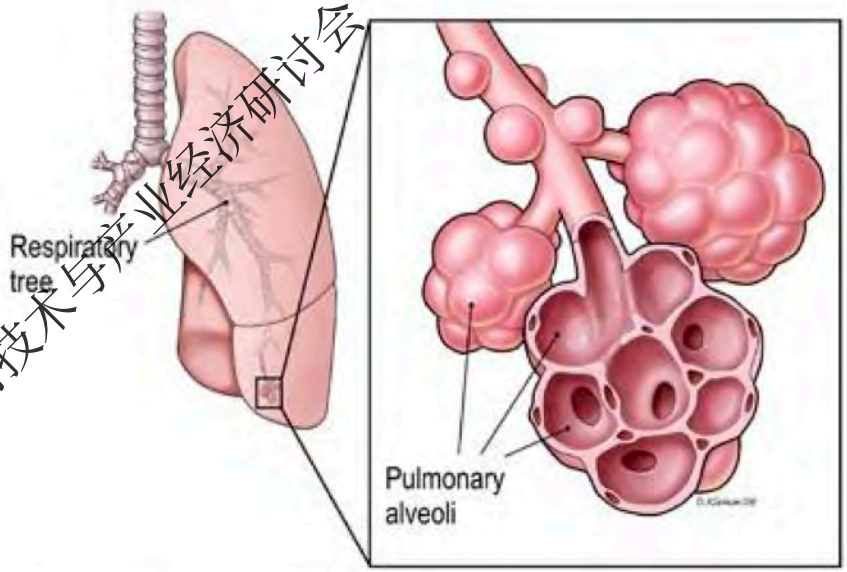
Animal well being concerns影响动物福利

Prevention is Important!

预防很重要

Respiratory Disease Anatomy
呼吸道疾病剖析





Prevalence of BRD
BRD流行率

- Nursing calves 犊牛
  - 3-24% suckling beef calves (Snowder, MARC 2005)

    3-24%的哺乳期犊牛

- Feedlot 育肥场
  - BRD incidence rate 5 to 40%　BRD发病率在5-40%
  - 75% of disease morbidity in feedlots (Edwards, 1996)

    育肥场75%的疾病问题是BRD

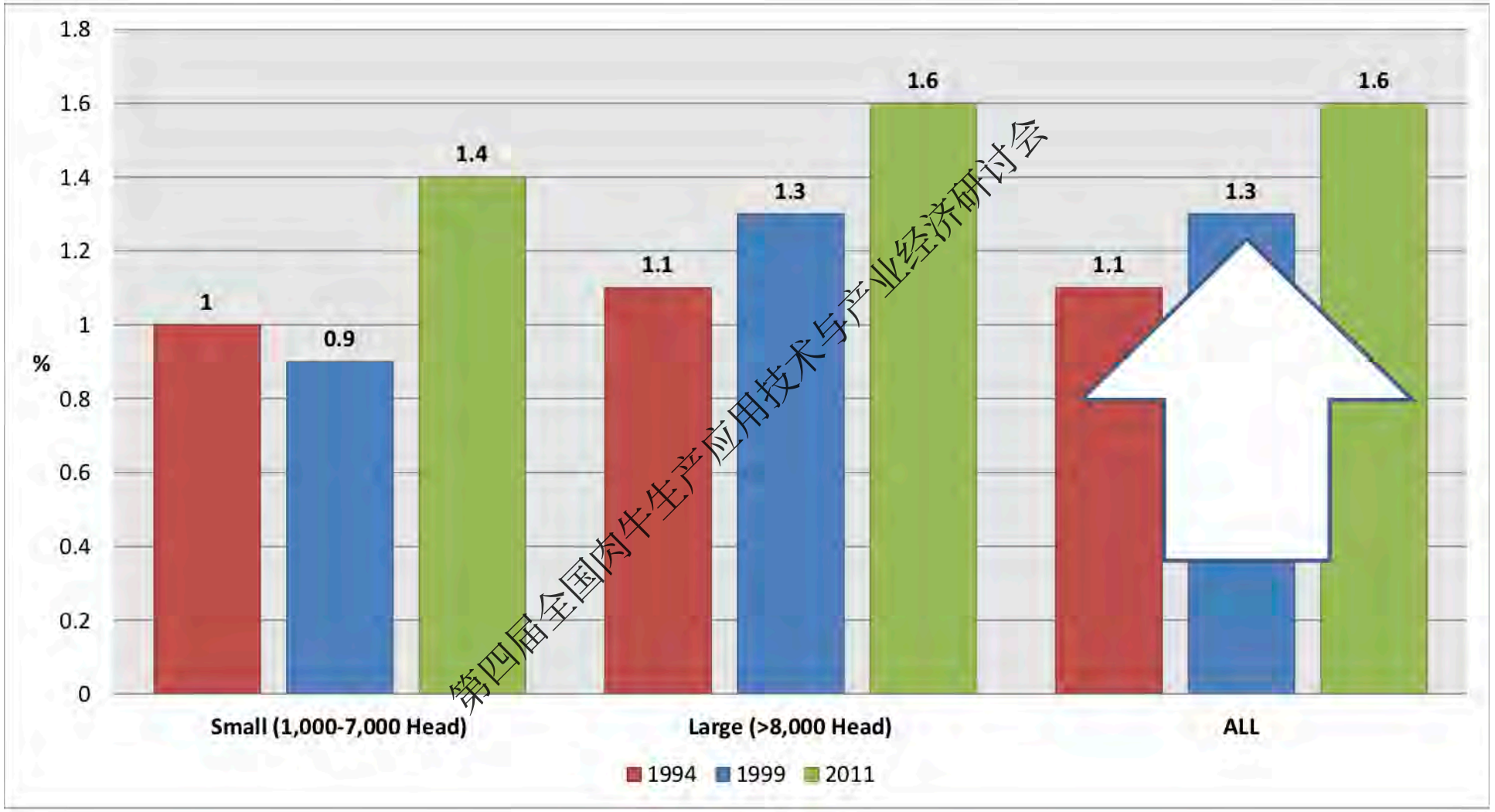
Mortality due to BRD
BRD的死亡率

- 1.5% - 3%

- 50% of the mortality in feedlots- (Edwards,1996)

育肥场50%的死亡又BRD造成

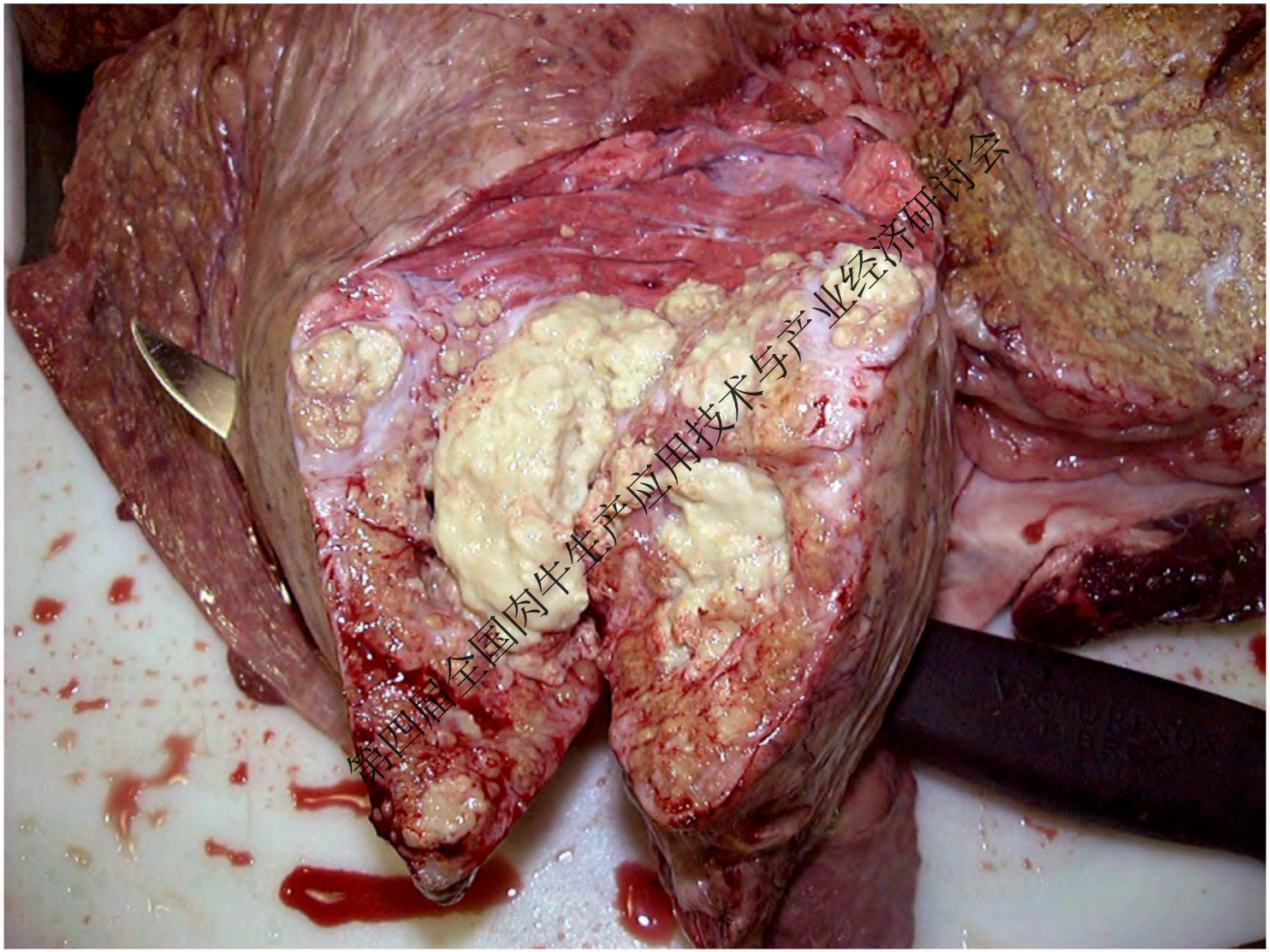
Feedlot Mortality Trends 育肥场死淘趋势

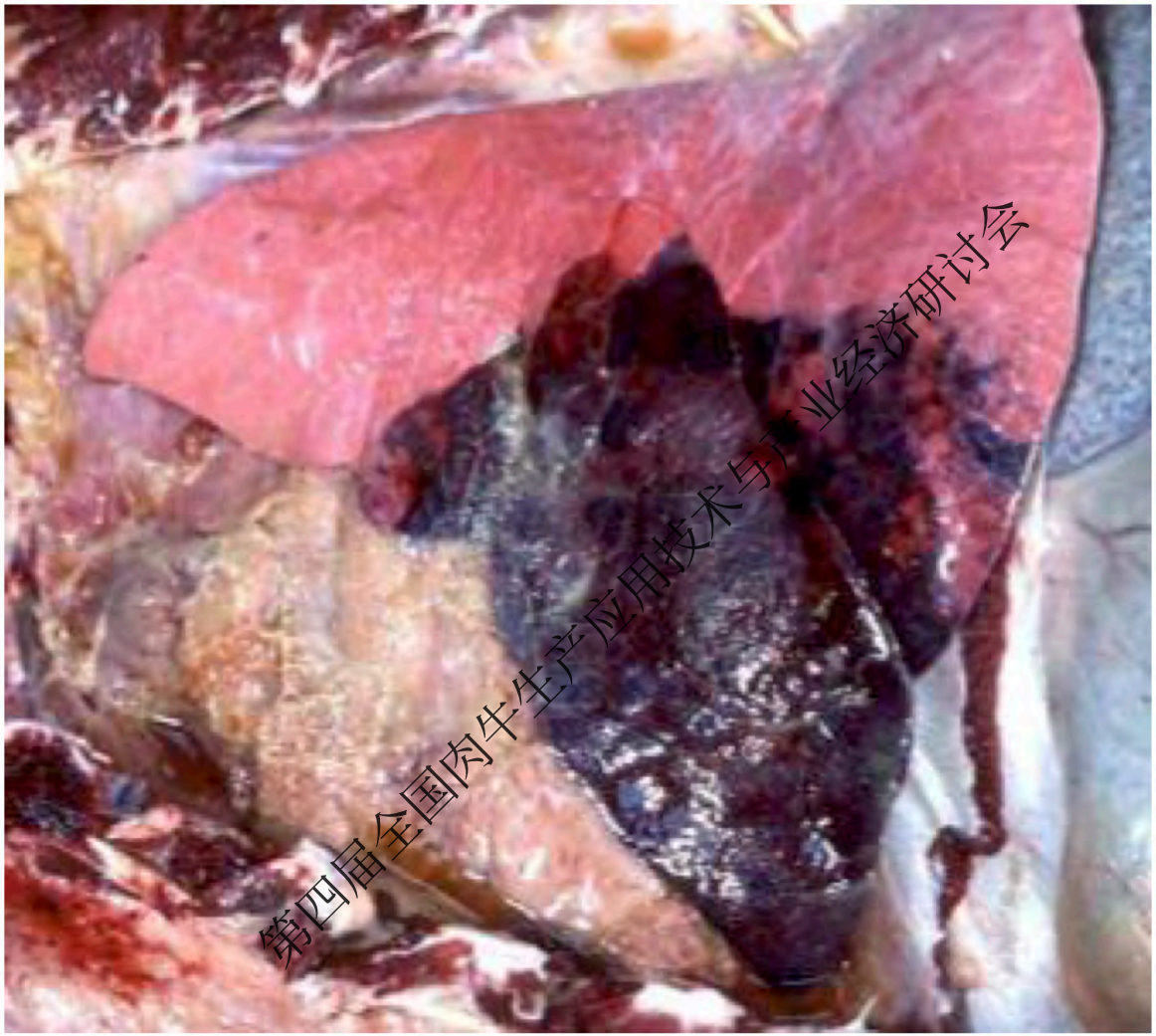


Difficulty Coping with BRD
对抗BRD的难度

- "Respiratory Challenged" 呼吸受到挑战
- Lung volume per unit of body weight 每单位体重对应的肺容量
- Resting volume of air静止空气量
- Reduced respiratory capacity呼吸能力降低

Dr Dan Upson, KSU pharmacologist


第四届全国肉牛生产应用技术与产业经济研讨会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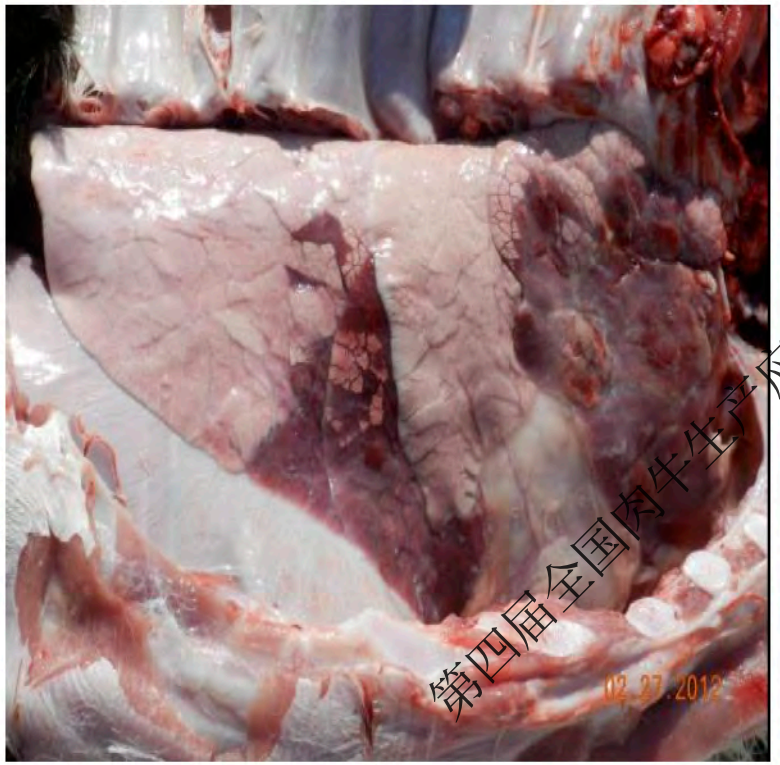
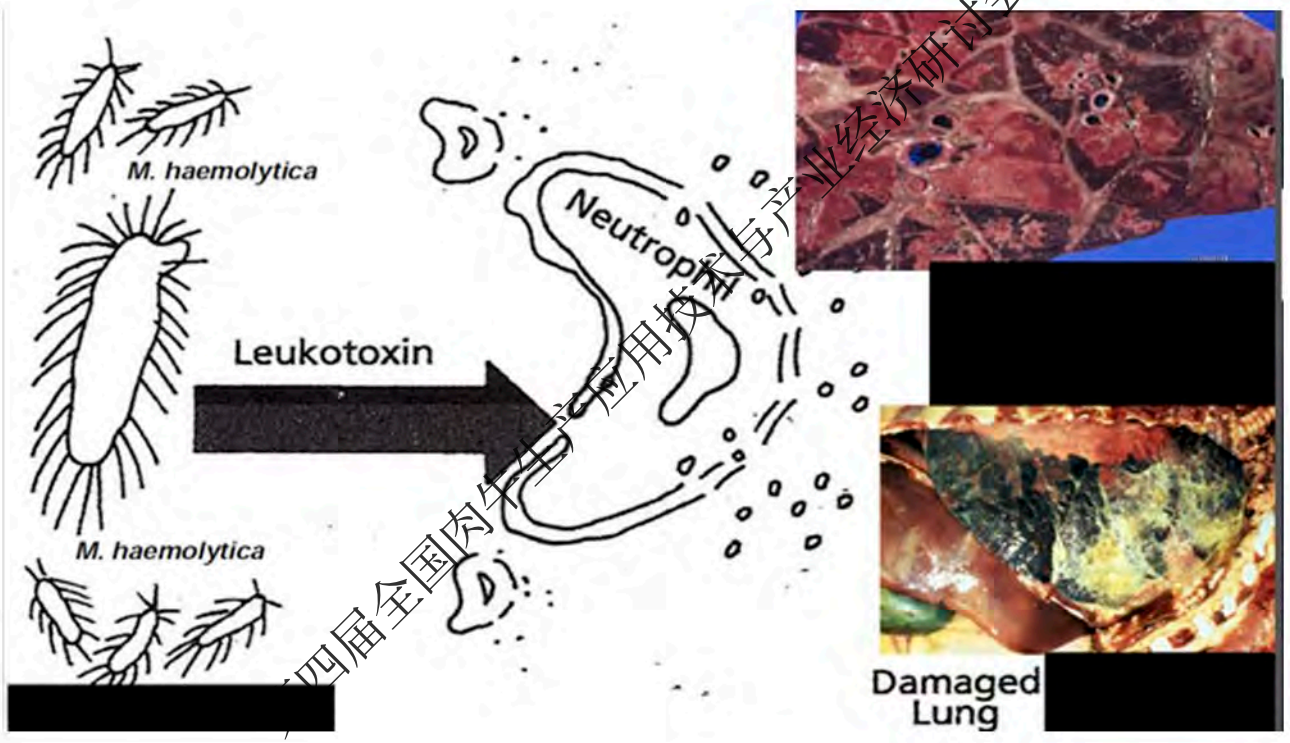




Effect of BRD on Feedlot Performance·
BRD对育肥场的影响

Parameters 参数	Non-Treated 不治疗	Treated Once 治疗一次	Treated Twice or More 治疗两次及以上
Days on Feed 饲喂天数	167[a]	178[b]	184[c]
Average Daily Gain (lb./day) 平均日增重（磅/天）	3.21[a]	3.06[b]	2.93[c]
Cost of Gain ($/lb.) 增重成本（美元/磅）	$0.62[a]	$0.69[b]	$0.75[c]
Treatment Costs ($/hd.) 治疗成本（美元/头）	$0.00[a]	$24.04[b]	$61.41[c]
Mortality Rate (%) 死亡率	0.09%[a]	4.21%[b]	15.46%[c]

[abc]Means within a row with different superscripts differ ($p<0.05$)

"Tri-County Steer Carcass Futurity Data", D. Busby, Proceedings of the 43rd Annual Conference of the American Association of Bovine Practitioners, August, 2010

47,764 beef calves
fed at 18 Iowa feedlots
2002 - 2009

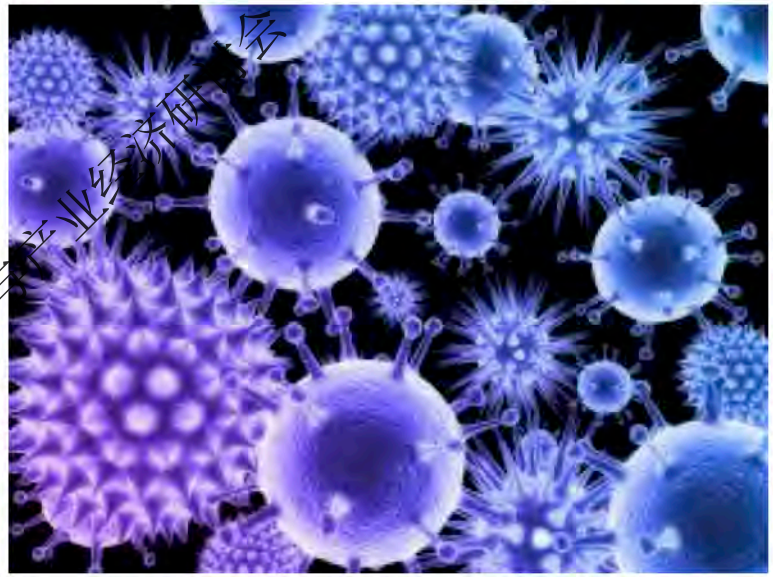
Pathogens 病原

OFTEN IN COMBINATION 通常为以下的组合

- Virus 病毒
- Bacteria 细菌
- Mycoplasma 支原体
- Parasites (Lung worm) 寄生虫（肺线虫）
- Fungal agents (Aspergillosis) 真菌（曲霉菌病）

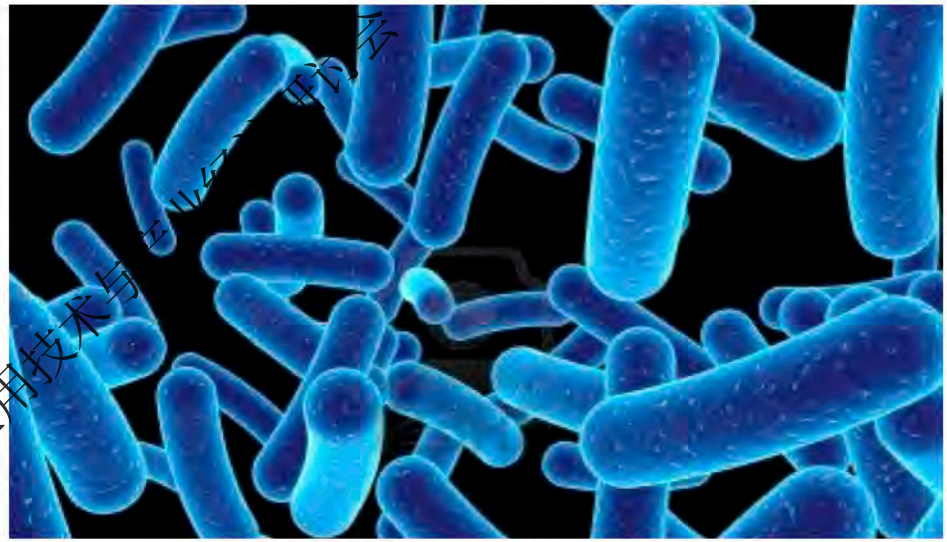
Respiratory Viruses 呼吸道病毒

- Infectious Bovine Rhinotracheitis (**IBR**) 牛传染性鼻气管炎
- Bovine Virus Diarrhea (**BVD**) 牛病毒性腹泻
- Parainfluenza – 3 (**PI-3**)牛副流感病毒
- Bovine Respiratory Syncytial Virus (**BRSV**)牛呼吸道合胞体病毒
- Corona virus冠状病毒

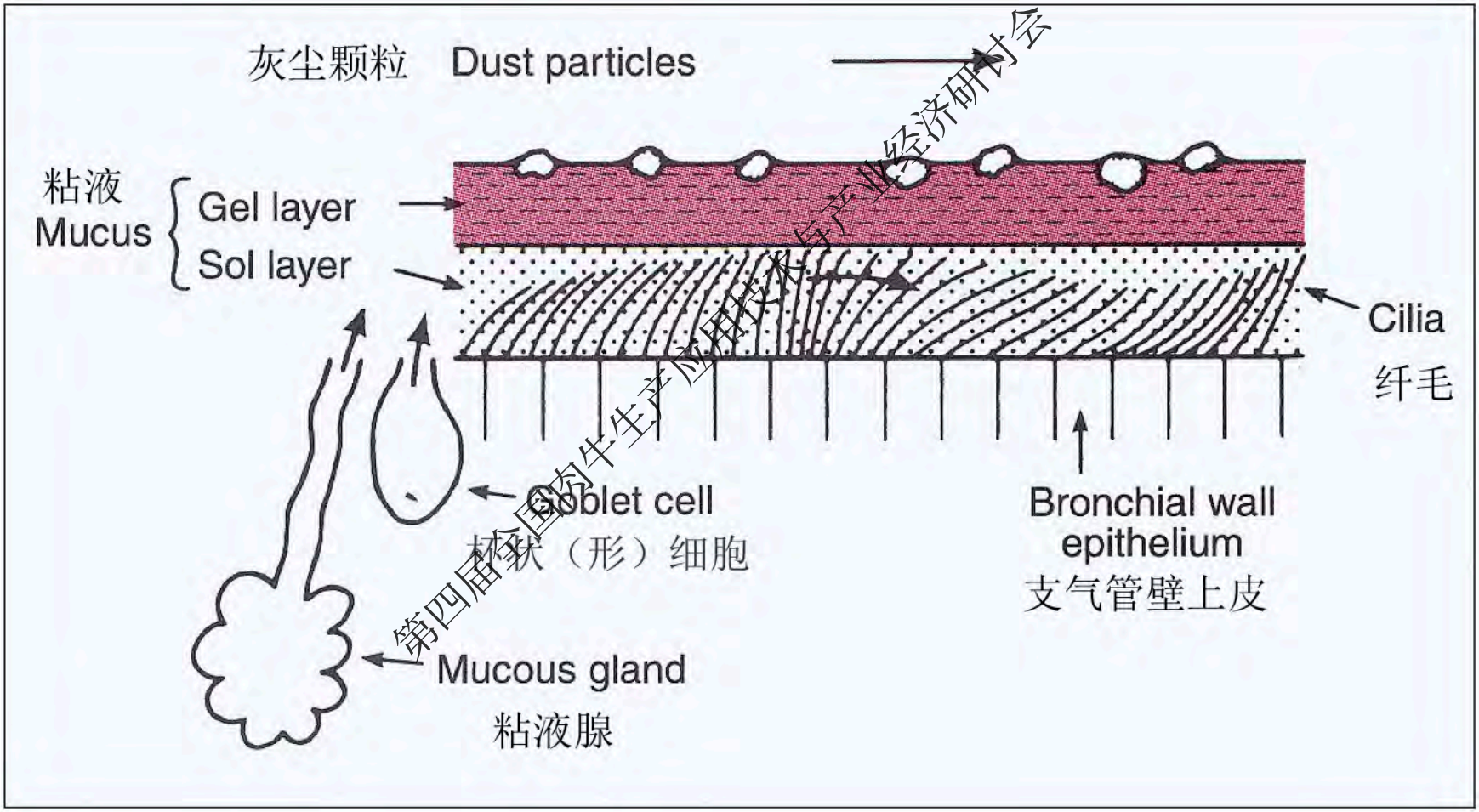


Respiratory Bacteria 呼吸道细菌

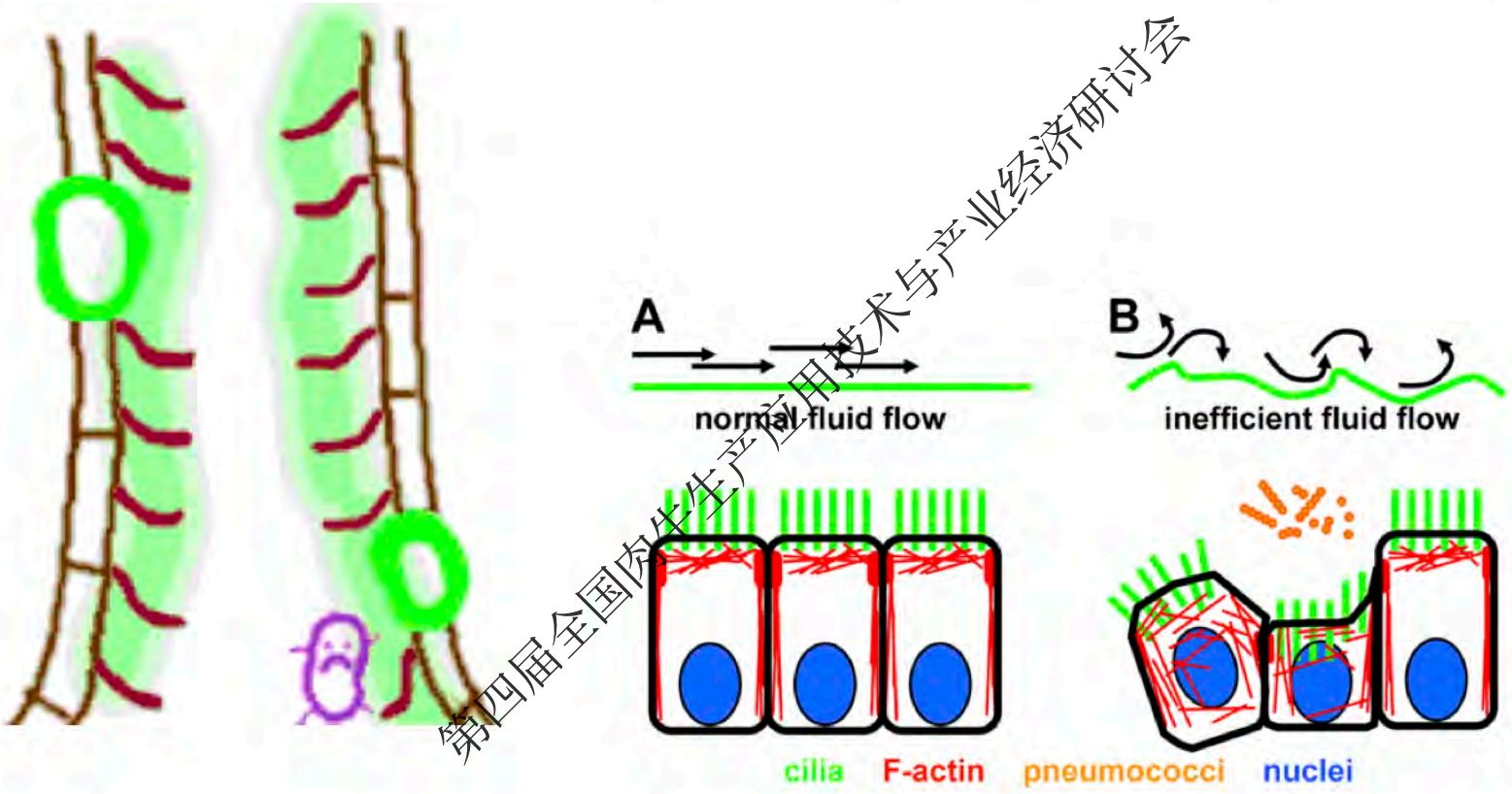
- *Mannheimia haemolytica* 溶血性曼氏杆菌
- *Pasteurella multocida*多杀性巴氏杆菌
- *Histophilus somni* 睡眠嗜组织菌
- *Mycoplasma spp*牛支原体
- *Actinomyces pyogenes*化脓放线菌
- *Salmonella Dublin*都柏林沙门氏菌

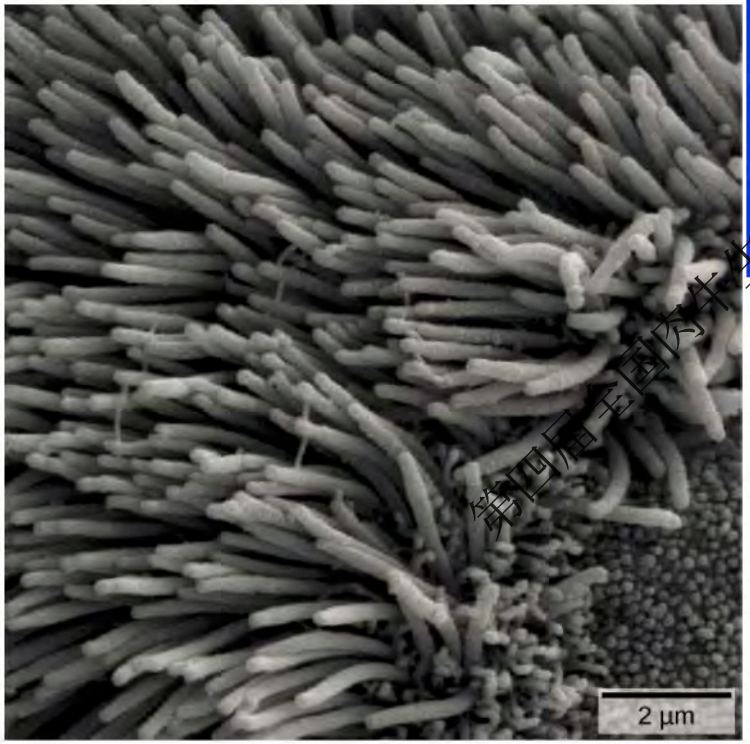


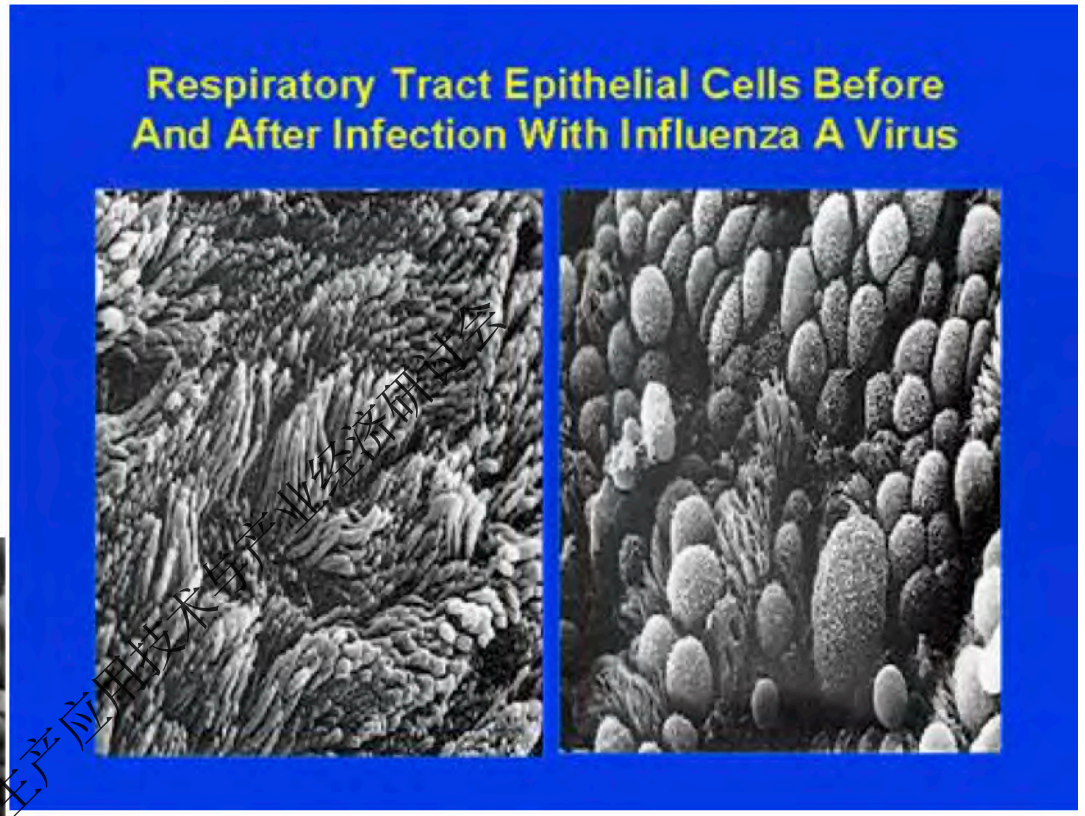
Mucociliary Escalator 黏膜纤毛活动梯



Mucociliary elevator 黏膜纤毛活动梯







RISK Factors 风险因素

Less than optimal immune function 免疫功能低于最佳

- Nutritional factors 营养因素
- Stress (additive) 应激-运输，气候，混群，脱水…
  - Transport, Climate, mixing, dehydration
- Failure of Passive transfer from Colostrum 初乳被动免疫获得缺失 – 母牛未接种疫苗
  - Dams not vaccinated
- Vaccination status 疫苗接种情况
- BVDV PI animals 病毒性腹泻持续性感染牛

Risk Factors Associated with BRD
与BRD相关的风险因素

- **Calves with inadequate passive immunity (colostrum) have a greater risk of:被动免疫力（初乳）不足的小牛有更大的风险：**
  - Death prior to weaning - 5.4X
  - 断奶前死亡 - 5.4倍
  - Being sick during the 1st 28 days of life (15 kg expected loss) – 6.4X
    出生28天内生病（预计损失15千克） - 6.4倍
  - Being sick any time prior to weaning – 3.2X
  - 断奶前的任何时候生病 - 3.2倍
  - Treated for BRD in feedlot – 3X
  - 在育肥场中因BRD而治疗 - 3倍

Risk Factors Associated with BRD
与BRD相关的风险因素

Mixing, stocking density, dust, mud 混群，畜群密度，沙尘，泥泞

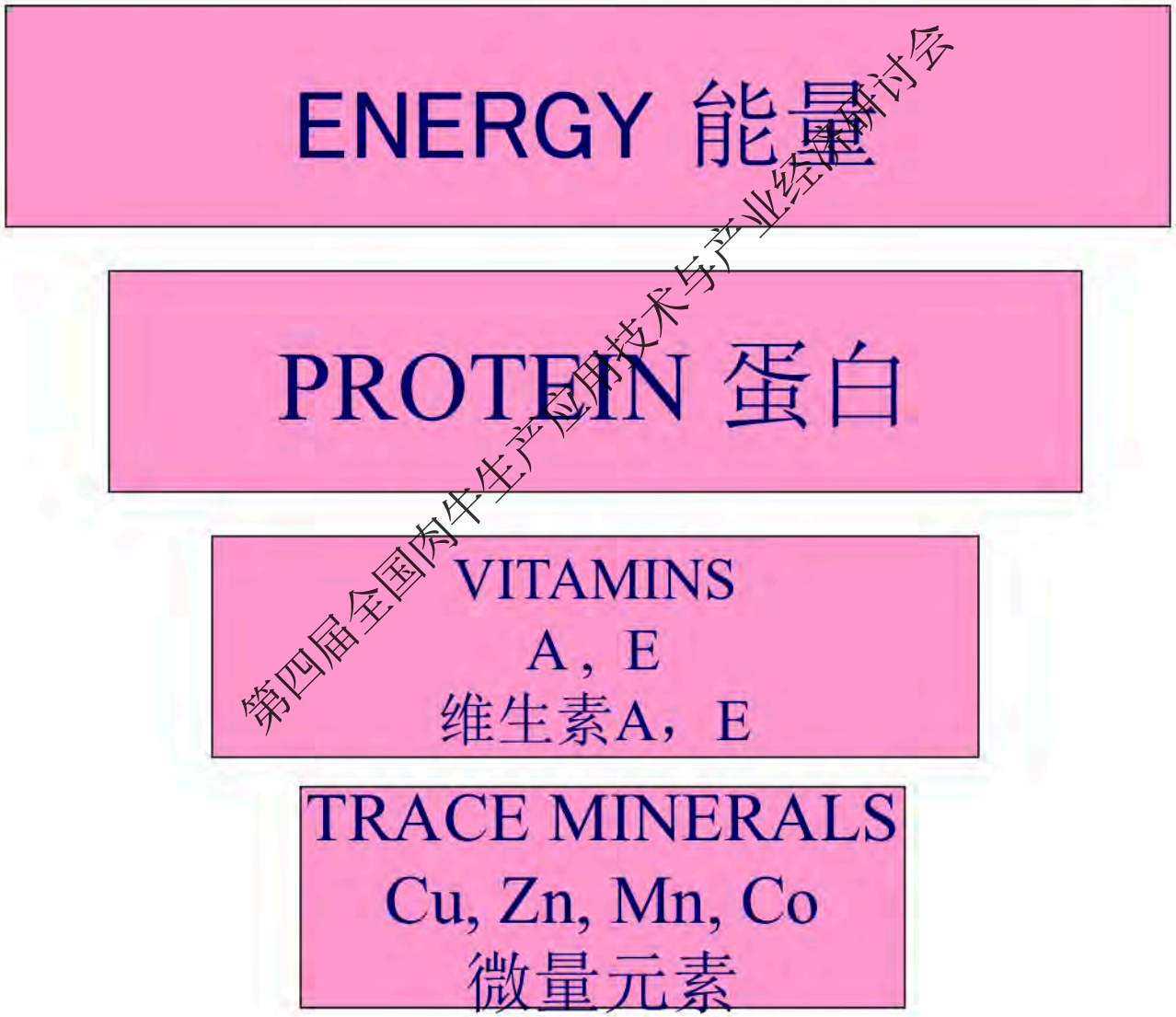
Transportation: excessive shrink (dehydration)

运输：过度的体重损失（脱水）

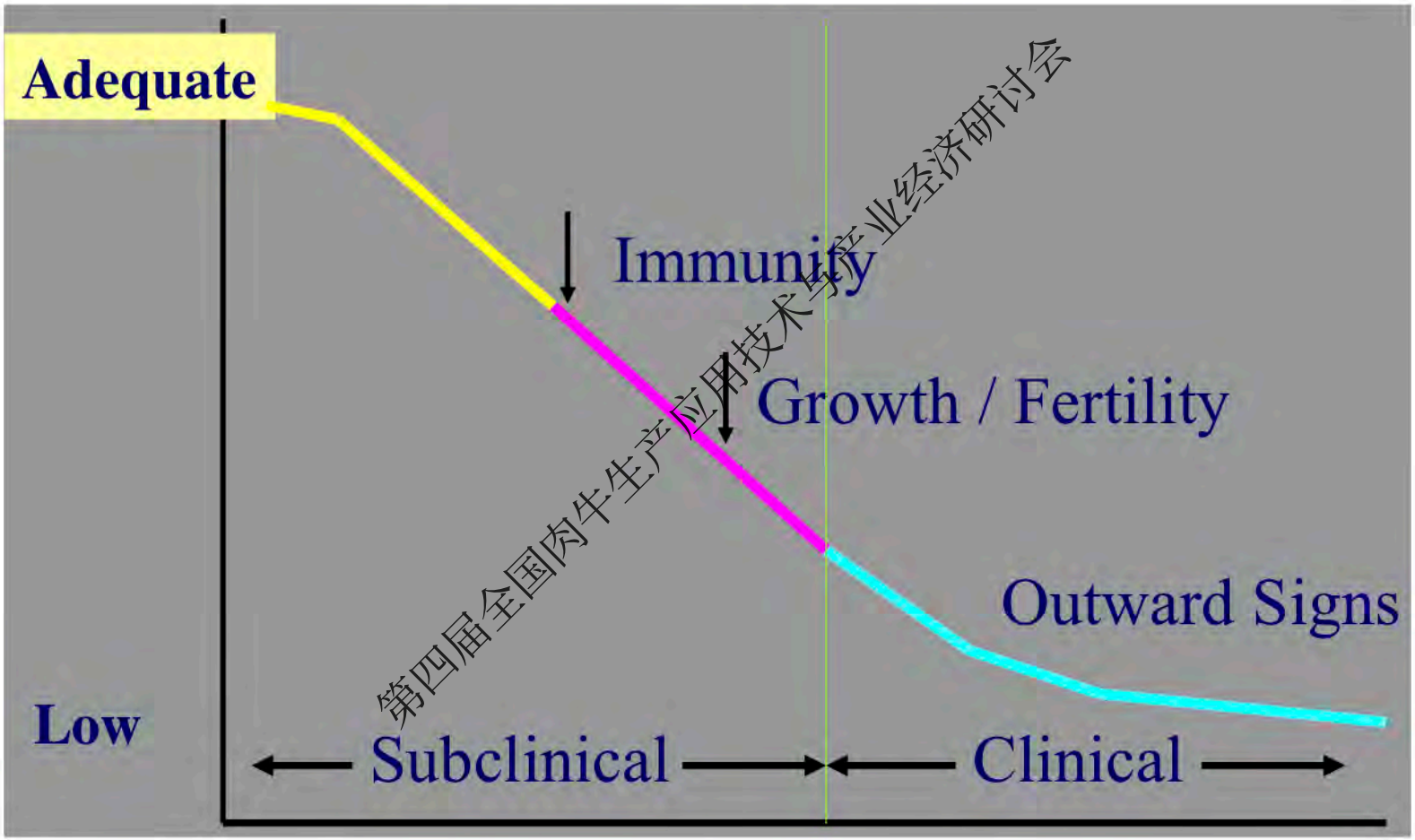
Stresses are additive

应激是可加的

Nutritional Effects on Immune System
营养影响免疫系统



Effects of Trace Mineral Deficiencies
微量元素缺乏的影响



Dr. Steve Wikse, Texas A & M

“The most important piece of information for a group of calves arriving at a feedyard is the health management program of the cow herd of origin.”

Dr. Dee Griffin

GPVEC

“到达饲养场的一组小牛最重要的信息是牛群的健康管理计划。”

迪格里芬 博士

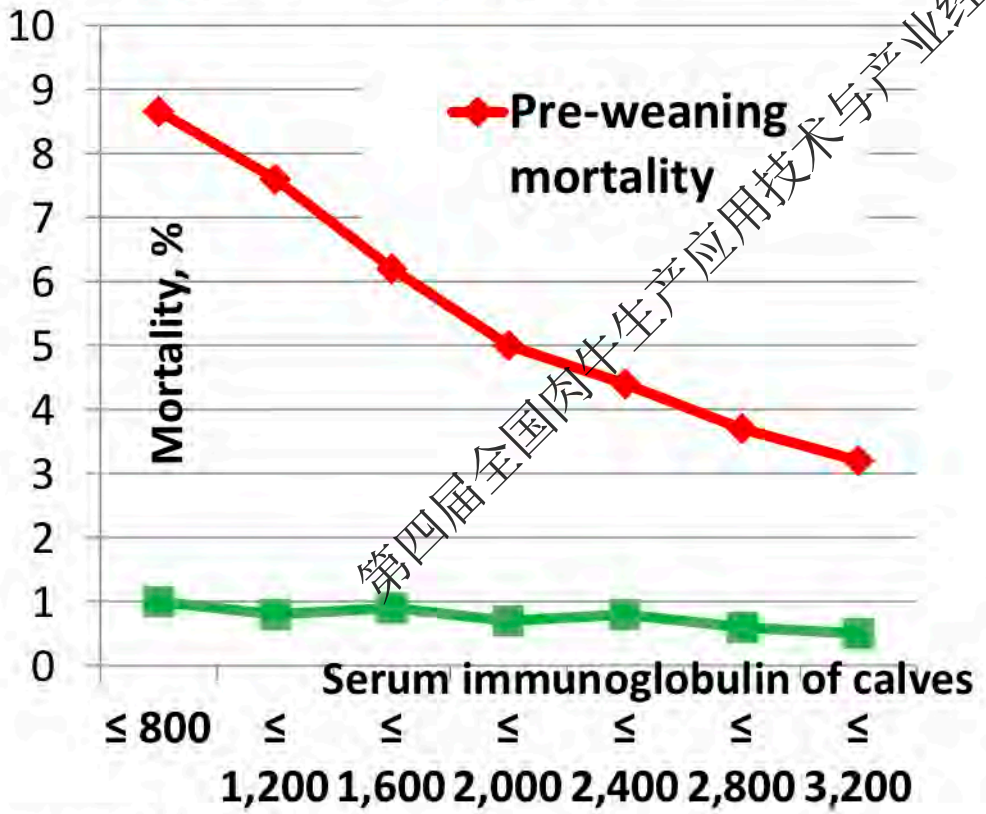
美国肉用动物研究中心

What about Mama cow? 对于母牛

- Adequate nutrition and BCS充足的营养和BCS
  - Protein and energy are critical 蛋白质和能量至关重要
  - Provide quality colostrum 提供优质的初乳
  - 90% fetal growth last 3 months of gestation (Ford/Funston)胎儿90％的增长怀孕后期3个月
  - Breed back after calving
  - Ideal BCS of cows 母牛理想的BCS

Focus on colostrum 关注初乳

- Colostrum impacts pre-weaning and feedyard health初乳影响断奶前和育肥牛健康



JAVMA, Vol 228, No. 6, 2006

“Immune Preparation is critical in preventing BRD”

“免疫准备对预防BRD至关重要”

Immune enhancement 增加免疫力

- Passive immunity : Colostrum / serum 被动免疫：初乳/血清
- Active Immunity : Vaccines 主动免疫：疫苗
- Nutrition 营养
  - Protein and Energy 蛋白和能量
  - Vitamins(Vit A/D/E) 维生素
  - Trace Minerals (Cu, Zn, Se, Chromium) 微量元素
  - Additives IgY , yeast products 卵黄抗体添加剂，酵母产品
- No Parasites (internal and external) 驱虫（体内外）
- Disease control 疾病控制
  - No BVDV PI 没有病毒性腹泻感染动物
  - Coccidiosis 球虫病
- Stress control 应激因素控制

A Woolums, Cornell Calf Congress, 2013

Maximize Immunity 最大化免疫力

- Healthy well fed mother 健康母畜
- Good colostrum absorption 良好的初乳吸收
- Good nutrition 良好的营养
- Vaccination prior to challenge 面临挑战前使用疫苗
- Parasite control 寄生虫控制
- Good weaning practice 良好的断奶管理
- Low stress transport 低应激运输
- Low stress handling on arrival 低应激到场赶牛

Parasite Effect 寄生虫的影响

- Direct 直接
  - Anorexia 厌食
  - interference w/ digestion 影响消化
  - increase gut motility 增加肠胃活动
  - mucus secretion, not absorptive 粘液分泌而非吸收
- Indirect 非直接
  - immune response suppression 免疫应答抑制

唯寄生虫不可妥协

IT DOES NOT NEGOTIATE WITH PARASITES.

IVOMEC® (ivermectin) 1% Injection

害获灭(伊维菌素)1%注射液

IMPORTANT SAFETY INFORMATION: *Do not treat cattle within 35 days of slaughter. Do not use in dairy cattle of breeding age or in veal calves. Do not treat swine within 18 days of slaughter. Do not use in other animal species not on the label as severe adverse reactions, including fatalities in dogs, may result.*

Vaccines 疫苗

- Viruses 病毒
  - BVDV (Bovine Virus Diarrhea) 病毒性腹泻
  - IBRV (Infectious Bovine Rhinotracheitis) or “Red-nose” 传染性鼻气管炎病毒也称红鼻病
  - BRSV (Bovine Respiratory Syncitial Virus) 牛呼吸道合胞体病毒
  - PI3V (Parainfluenza Virus) 副流感病毒
  - RCV (Respiratory Coronavirus) 呼吸道冠状病毒
- Bacteria 细菌
  - *Mannheimia haemolytica*溶血性曼氏杆菌
  - *Pasteurella multocida*多杀性巴氏杆菌

Prior to arrival at feedlot 育肥场到场时的首要任务

- Well fed calf 良好的饲喂
- Parasite control 寄生虫控制
- Vaccinated (weeks before) 疫苗（几周前）
- Weaned, castrated , dehorned 断奶，去势，去角
- Bunk training 饲槽训练
- Minimal mixing with other animals 最少量的与其他牛只混群
- Minimal stress transport 最小化运输应激
- Low stress handling 最小化赶牛处理应激

On arrival 到场

- Delay processing 1 hour for every hour of transport 每运输1小时就延迟1小时到场处理时间
- Try to close pen (no new arrivals) at maximum of 2 days 尽可能两天内每个牛圈不放入新进牛只
- Plenty of bunk space (minimum of 40 cms) 足够的饲槽空间（最小40厘米）
- Easy access to clean water（尽早供应清水）
- Grass hay in bunk (similar to what they are used to) 饲喂干草（尽量与牛只之前饲料相似）
- On second day top dress hay with concentrate ration 第二天可以在干草上加入精料

Processing 处理

- Vaccination 疫苗
  - Viral / Bacterial / Clostridial 病毒/细菌/梭菌
- Parasite treatment 驱虫
  - Intestinal / Lice (biting lice need pour on product)
    肠道寄生虫/虱子（啮虱需要浇泼剂产品）
- Ear Tags 耳标
- Implants 激素植入
- Metaphylaxis 预防性治疗

Metaphylaxis 预防性治疗

- Treatment of a group of animals currently experiencing any level of disease prior to onset of blatant illness. 在发生明显疾病之前治疗目前正经历任何疾病水平的动物
- Used in feedlot industry to control BRD

在育肥模式常用于控制BRD

- Not a band-aid for poor management, FPT, nutrition 并非牧场管理水平低下或营养等问题的“创可贴”

Metaphylaxis 预防性治疗

- PMI (post metaphylaxis interval) 治疗后观察期
  - Do not treat for BRD in this interval 不要在如下观察期内再次治疗
    - Zactran is 5 days 专克灵至少5天
  - During this time check for lameness, eating, water

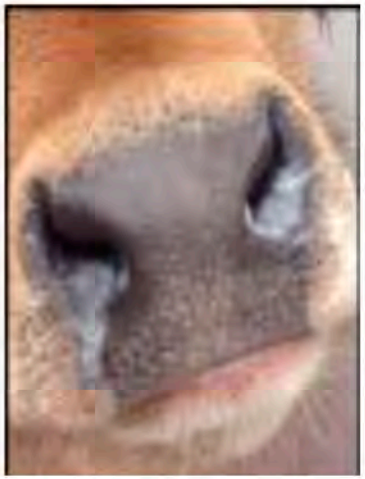
与此同时可以检查跛行，饲粮，饮水

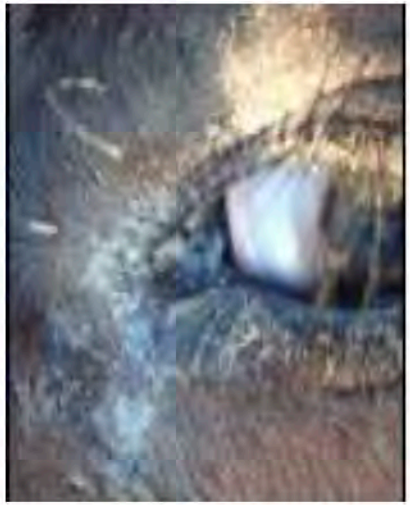
Diagnosing BRD 诊断BRD

- Clinical Signs 临床症状
  - DART
  - depression, anorexia, respiration, temp

  DART标准：精神沉郁，厌食，呼吸状态，体温
- Necropsy 剖检
- Ultrasound 超声
- Deep pharyngeal swabs 深咽拭子
- Broncho alveolar lavage支气管肺泡灌洗

Clinical symptoms 临床症状





- Fever 发热
- Off- feed 低头
- Depression 沉郁
- Nasal/Ocular discharge 鼻/眼分泌物
- Cough 咳
- Droopy ears 耳朵耷拉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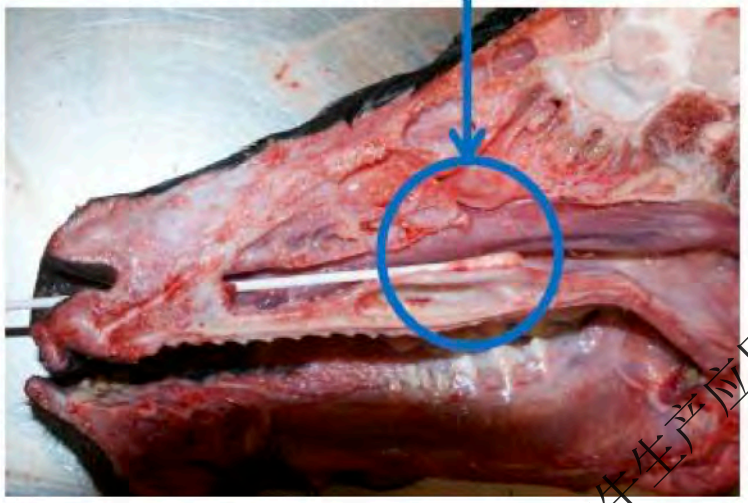
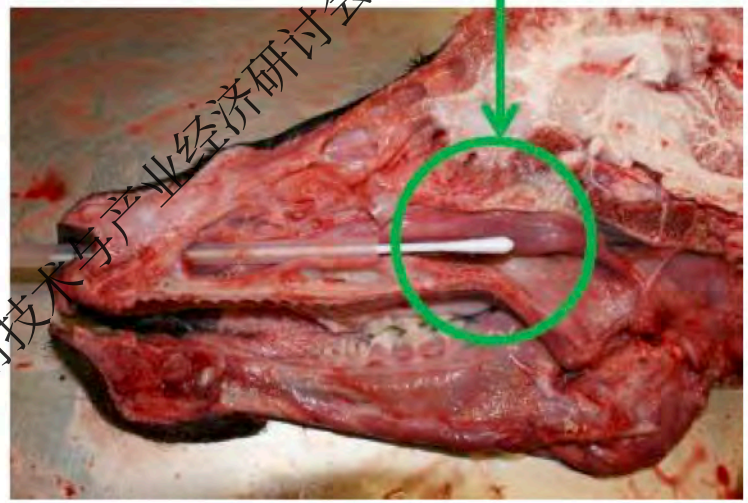
BRD Diagnosis BRD诊断

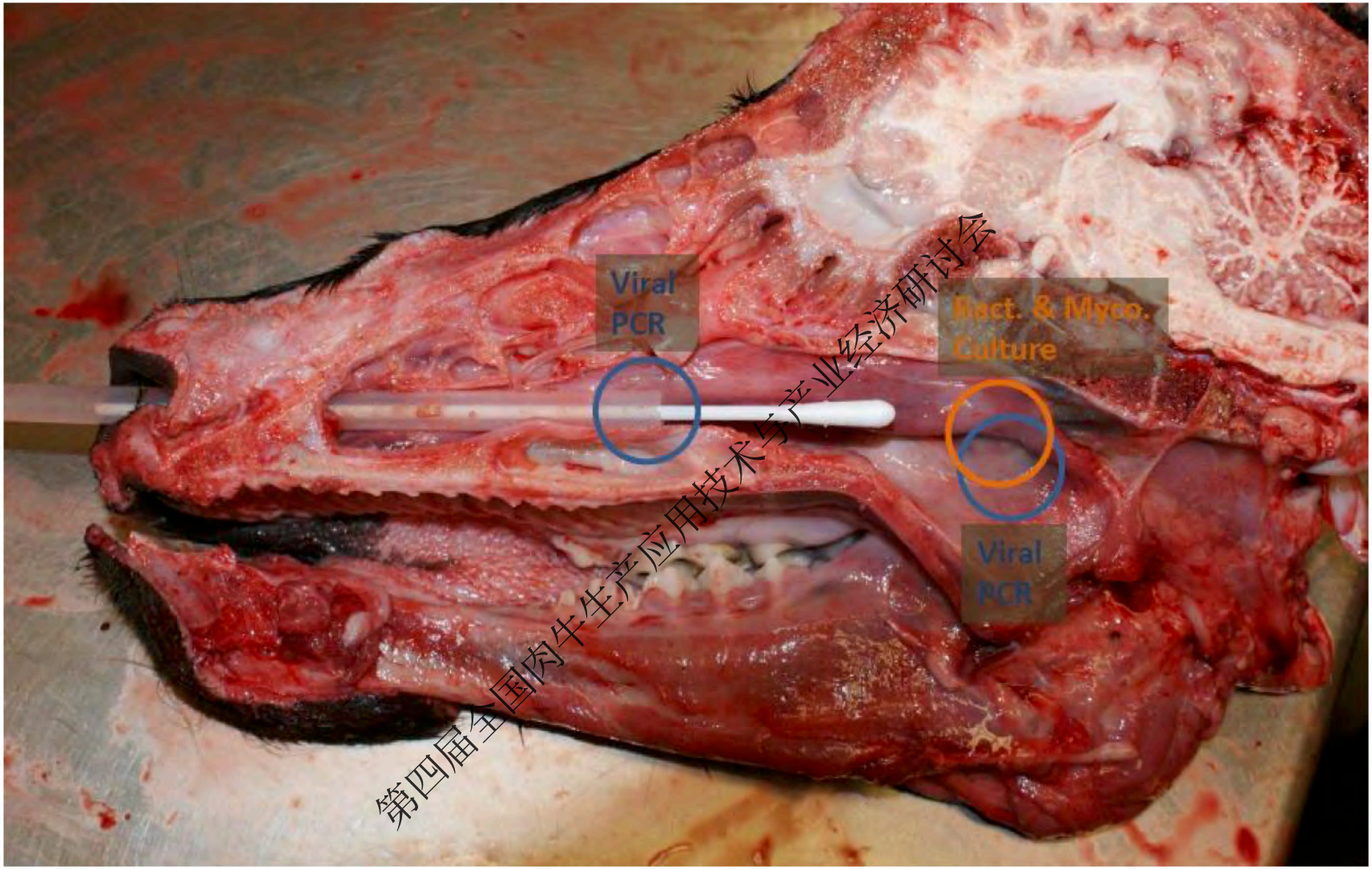
Nasopharynx



Pharyngeal Recess

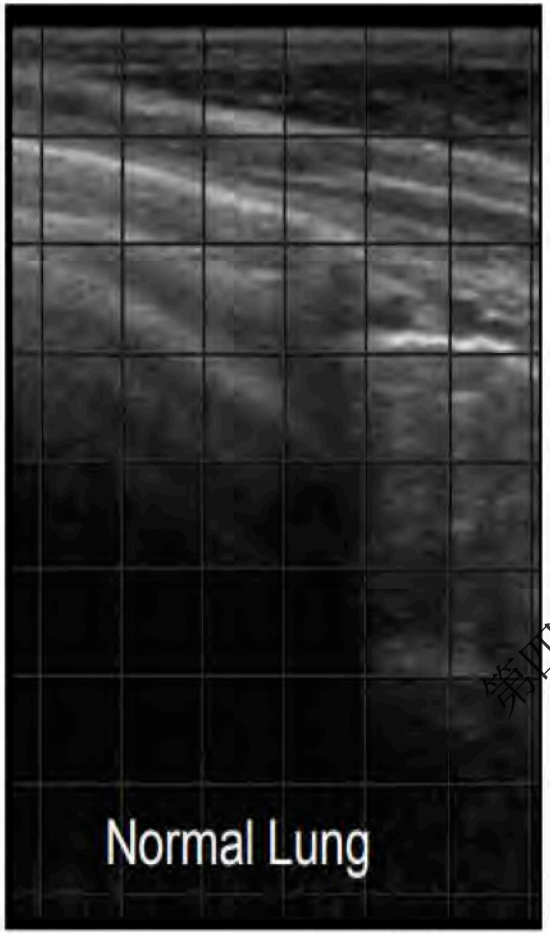


Photos courtesy of Dr T Lehenbauer



Photos courtesy of Dr T Lehenbauer

Thoracic Ultrasound 胸腔超声检查



Dr. Terri Ollivett

Dr. Terri Ollivett

- Detect subclinical disease检测亚临床疾病
- Accuracy of clinical detection 临床检测的准确性
- Is metaphylaxis or treatment effective 预防性治疗或治疗效果
- Prognosis 预后

BRD Treatment Principles
BRD处理原则

- Identify sick calves early及早发现病牛
- Involve your vet in treatment protocol design
  让你的兽医参与治疗方案设计
- Know when to not treat 知道何时治疗
  - chronic cases etc.慢性病等
- Monitor response to treatment监测治疗反应

Treatments for BRD 治疗BRD

- Antibiotics 抗生素

  Macrolides 大环内酯类

  -Zactran® (gamithromycin), 专克灵（加米霉素）

  Beta lactams β内酰胺类

  Chloramphenicol derivs.氯霉素衍生物

  Fluroquinolones氟喹诺酮类药物

  Tetracyclines四环素

  - Biomycin®, LA200®

- *Pain / Pyrexia / Endotoxemia 镇痛解热*

  -METACAM (meloxicam) 美达佳（美洛昔康）

- *Electrolyte Replacer电解质*

  — Diaque® 达可

Choice based on:
- **Culture and sensitivity**
- **Age of calf**
- **Compliance**
- **Dose frequency**
- **Cost**

What treatment should I use?
我该采用何种治疗

Use diagnostics: 病原检测

- Swab 5-6 new untreated cases 采5-6个拭子样
- Aerobic culture and sensitivity 有氧培养
- Mycoplasma culture 支原体培养
- Viral multiplex PCR 病毒多重PCR

Develop a protocol with your veterinarian: 与兽医探讨制定方案

- Target most likely bug or from diagnostic results 针对最可能的问题或由诊断结果
- On label 标签规范使用
- Wait 72 hours before switching antibiotics 更换抗生素至少等72小时
- Adjunct therapy 辅助治疗

If Mycoplasma is detected, don't use beta-lactams.
如果发现支原体，不要使用β内酰胺类

Treat or not to Treat
治疗或不治疗

Treat
治疗

- Past PMI

治疗后观察期过后

- Keep in original pen unless cannot compete for feed

保持原始分栏除非发生争夺饲料

Don't treat
不治疗

- more than 3 times treated

已经多于3次治疗

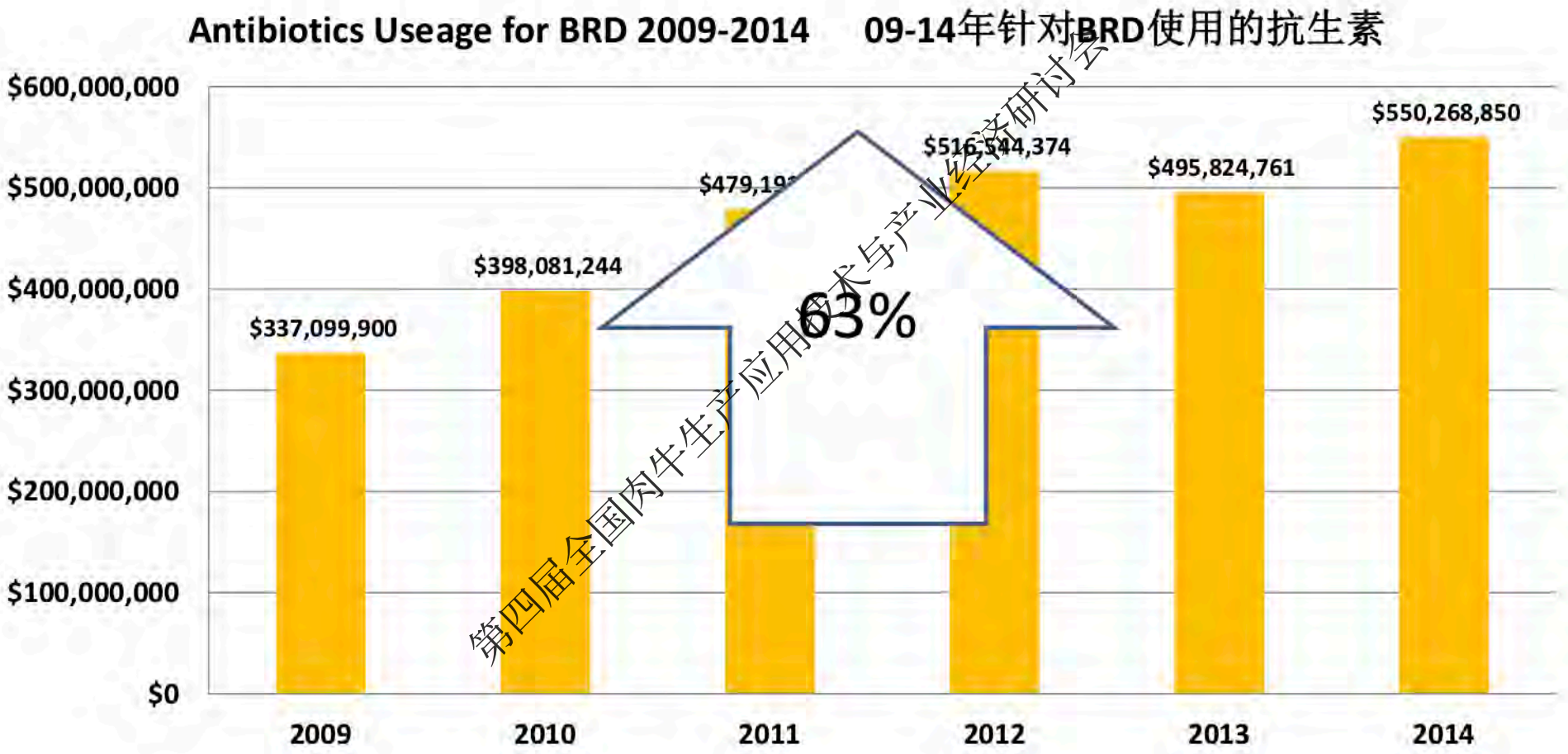
- Remove from original pen

从栏中移出

- Send to slaughter

送去屠宰

Trends in Health 动保趋势



ZACTRAN (gamithromycin)
专克灵（加米霉素）

WARNING: 警告

- 用于牛
- 不适合人类使用
- 保证儿童不会接触到药物
- 不适用于禽类
- 残留警告：不要用在35天内屠宰的牛。由于弃奶期尚未确定，因此不要在20个月或更大的泌乳牛使用。在反刍前犊牛中该产品尚未确定停药期，不要用于加工小牛肉的犊牛

PRECAUTIONS 警惕

- 专克灵对牛繁殖性能、妊娠和哺乳的影响尚未确定。皮下注射专克灵可能在一些牛中引起短暂的局部组织反应，这可能导致屠宰时可食用组织的微量损失。

ADVERSE REACTIONS 不良反应

- 在用专克灵治疗的牛中有可能看到动物短暂的不适和轻度至中度的注射部位肿胀。

ZACTRAN is available in 500, 250 and 100 mL sizes.

Trade Name	ZACTRAN®
FDA Approval	NADA 141-328
Active Ingredient	Gamithromycin
Antimicrobial Class	Macrolide
Subclass	Azalide
Formulation	150 mg/mL
Dosage	6 mg/kg
Injection Volume	2 mL/110 lbs. (1 mL/25 kg)
Low Plasma Binding[6]*	26%
High Available Free Drug[6]*	74%
Bioavailability[1]*	Complete
High Volume of Distribution[6]*	25 L/kg
BRD Treatment Duration[3]	10 days
BRD Control Duration[5]	10 days
Rapid Treatment Response[3]	24 hours

* Clinical relevance has not been determined.

感谢观看！