



法国卡苏官方微信平台 Wechat



中国移动 16:26 81%

返回 法国卡苏 ...

法国卡苏 · 世界生物繁育技术的先驱

关于卡苏 产品展示

荣誉用户 技术问答

卡苏新闻 卡苏专家 经销网络 联系我们



互动、交流、共享

世界生物繁殖技术的先驱

World Leader in Reproduction Biotechnologies



上世纪九十年代，IMV(卡苏)公司将猪人工授精的先进技术及理念带到了中国！
In the 1990s, IMV brought advanced technologies of swine AI into China!



IMV(卡苏)公司为中国大熊猫的繁育做出了贡献！
IMV contributes to China Panda breeding!

国际化的法国IMV(卡苏)公司

IMV Technologies throughout the world



经销商及代理商遍布全球120多个国家和地区

Dealers and agents all over the world more than 120 countries and regions



法国IMV(卡苏)公司在中国的发展

Growth & Development of IMV Technologies in China

➤ 1946年 罗伯特·卡苏创立世界上第一家牛人工授精中心

In 1946, Robert Cassou established the first French AI center for cattle

➤ 1963年 IMV TECHNOLOGIES成立

In 1963, Robert Cassou founded IMV (Instruments de Médecine Vétérinaire)

➤ 1980年 卡苏技术及理念进入中国

In the 1980s, IMV technologies and concepts entered China

➤ 2002年 法国IMV(卡苏)在北京设立代表处

In 2002, IMV established a representative office in Beijing



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



法国IMV(卡苏)公司在中国的发展

Growth & Development of IMV Technologies in China

➤ 2011年 IMV(卡苏)与上海多仔福建立战略合作关系

In 2011, IMV - partnership – Dofu Shanghai

➤ 2012年 注册成立“上海卡苏生物科技有限公司”

In 2012, IMV Technologies (Shanghai) Co. Ltd was founded

➤ 2014年 上海卡苏成立猪业产品线团队

In 2014, complete team dedicated to swine support

➤ 2015年 上海生产基地乔迁新址，10000 m²，净化车间3300 m²，理化实验室，模具加工

In 2015, moved to a new factory, 10000 m², purification workshop 3300m², a lab, moulds room



世界生物繁殖技术的先驱

World Leader in Reproduction Biotechnologies

猪人工授精专业品牌

Professional Brand in Pig Artificial Insemination

DCFU多仔福
法国卡苏旗下品牌

提供最为领先的猪人工授精技术、设备和解决方案

Provide the Most Advanced Technologies, Equipments
and Solutions in Swine AI



猪业产品线团队 Swine Team



北方区销售经理
North Manager
张振辉Jeff Zhang



中部区销售经理
Central Manager
徐强波Xu Qiangbo



南方区销售经理
South Manager
徐 辉Phillip Xu



产品应用经理
Application Manager
赵伟宾Zhao Weibin



销售订单助理
Business Assistant
侯 君Hou Jun



猪业产品线经理
Marketing Manager
严 明Yan Ming



猪冷冻精液的制作和解冻操作流程

Boar Semen Freezing & Thawing Protocol



www.imv-technologies.com

法国 IMV 卡苏

世界生物繁殖技术的先驱

World Leader in Reproduction Biotechnologies



• Frozen Semen冻精

- 99,5 % of world swine insemination are performed with fresh semen
全球猪鲜精配种使用率≥99.5%
- 0,5 % of world swine insemination are performed with frozen semen
全球猪冻精配种使用率≤0.5%

30 labs freeze semen : USA, GB, Italia, Spain, France, Germany,
Sweden, DK, Tchequia, Belgium, China

全球30多家猪冻精实验室分布：美国、英国、意大利、
西班牙、法国、德国、瑞典、丹麦、比利时、中国等



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



- **Advantages for Genetics company and Swine producers**
对育种公司和猪业生产者的益处

- ▶ **Semen Distribution & Export.** 精液销售和出口
- ▶ Permit storage and transport of Swine semen without the constraints imposed with the use of the marketed extenders

使得精液保存和运输不受稀释剂因素制约

- ▶ Facilitate international dissemination of advance genetics specially to countries with strict biosecurity regulations.

促进了优秀种猪基因的国际传播，尤其对生物安全监管非常严格的国家有利

- ▶ Producers can complement their genetics with high quality boar semen from anywhere in the world

种猪销售公司通过使用其他国家的高品质公猪精液，可以优化种群基因

- ▶ **Preservation of Genetic value.** 保存基因价值

- ▶ Frozen semen eases the preservation of high quality genetic lines

冻精让高品质基因系的保存更简便



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



- **Advantages for Genetics company and Swine producers**
对育种公司和猪业生产者的益处

- ▶ **Sanitary evaluation of semen before use (PCR test)**

精液使用前的安全卫生评估

- ▶ It is possible to test frozen semen in accordance to local regulations before introducing semen into farms.

使用前能够根据当地规定的标准检测冻精

- ▶ It also permits its preservation away from the boar stud
也能够在公猪站之外保存

- ▶ Frozen semen may be used to repopulate farms after disease outbreaks

爆发重大疾病、疫情的猪场，可使用冻精重新开始繁育工作，实现无抗供种



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



- **Advantages for Genetics company and Swine producers**
对育种公司和猪业生产者的益处

- ▶ **Genetic improvement** 品种改良
- ▶ Frozen semen may be usefull in the futur for progeny testing and AI boar selection
冻精可能有助于将来的系谱检测和种猪选择
- ▶ Frozen semen makes it possible to inseminate high quality gilts, assuming gilts present oestrus erratically and unpredictably
冻精可用于配种优秀的后备母猪和情期不规律且不可预知的后备母猪
- ▶ **Bio Banking of Genetic Biodiversity/ ressource**
遗传多样性/遗传资源生物样本库
- ▶ Frozen semen « banks » of genetic lines in danger of desapearance are made possible 濒临灭绝基因品系低温样本库



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Simple Technique 技术简易

- In order to be successful using frozen semen, freezing, thawing and insemination techniques have to be simple but precise

为了有效使用冻精，精液冷冻、解冻和配种技术必须简易但精确

- This is the only way to guarantee high fertility and litter size similar to those obtained with liquid semen

这是确保受胎率和窝产仔数接近于鲜精操作结果的唯一途径



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Extender preparation 稀释液配制

- Extender must be diluted with pyrogen free water, double distilled or equivalent quality water.

稀释用水必须是无热原水、双蒸水或同等品质的实验室用水

- Appropriate sterilized glassware

合适的消毒过的玻璃器皿

- Heated magnetic stirrer

磁力加热搅拌器



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Extender preparation 稀释液配制

Washing and centrifugation extender: PRIMXcell

冲洗和离心稀释粉：PRIMXcell 卡苏中效稀释粉



Dilute the entire contents of the pouch into 1 liter of water at 32 °C to 34 °C (89,6°F to 93,2°F)

1包PRIMXcell 兑换1升实验室用水（32°C to 34 °C）

Stir until complete dilution

搅拌到完全溶解

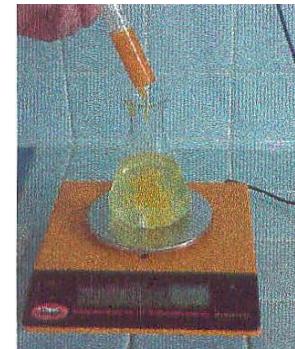
世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Extender preparation 稀释液配制

- Boarciphos Cooling Extender: ref 002278

Boarciphos 冷却稀释粉



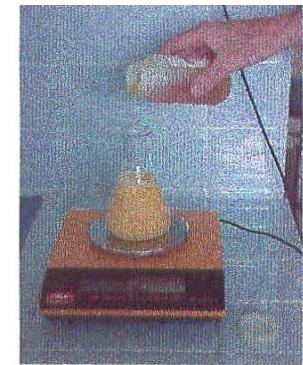
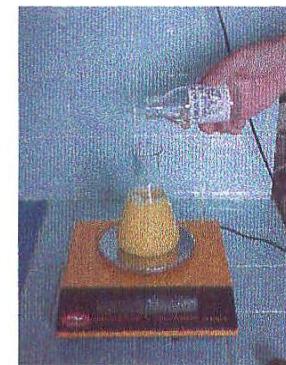
- Dilute the bag of Boarciphos A in 200 ml of water
1包Barciphos 兑换200ml实验室用水
- After complete dilution add 50ml of egg yolk, Cool down to 15 to 17°C (59°F to 62,5°F) 完全溶解后加入50ml卵黄，冷却至15°C-17°C

世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Freezing Extender preparation 冷冻稀释液配制

- Dilute the bag of Barciphos « B » in 200ml of water.
1包Boarciphos B 兑换200ml实验室用水
- When components are dissolved, take 200ml of this solution and Add 50 ml of egg yolk, 20,36grams of warmed glycerol and 4 ml of warmed O.E.P.
完全溶解后，取200ml，加入50ml卵黄、20.36g预热过的甘油和4ml预热过的O.E.P.冻精稀释剂
- The warm temperature will ease their addition to the preparation
加热的目前是为了方便添加

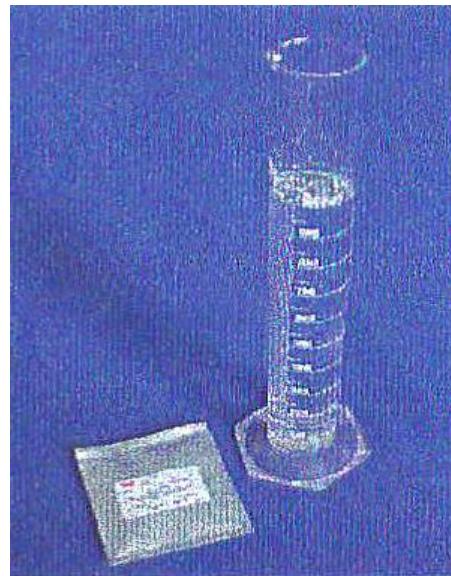


世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



- Thawing and Insemination Extender 解冻稀释剂

- Ref 023083 NUTRIXcell+



- Dilute the entire contents of the pouch in water at 32 °C to 34 °C (89,6°F to 93,2°F)

1包NUTRIXcell+ 兑换1升实验室用水（32 °C to 34 °C）

世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Semen freezing Protocole 猪精液冷冻步骤

- Collect only the rich fraction of the ejaculate and process immediately as follow:
仅采集有效部分精液并立即做如下分析
- Assess the motility of semen under the microscope
检测精子活力
- The ejaculate must have at least 85% motile, 85% normal
活力≥85%， 畸形率≤15%
- Assess the concentration
检测精液密度
- Dilute the Ejaculate with up to 300ml of washing extender at 32 °C to 34 °C (89,6°F to 93,2°F)
取300ml实验室用水（32 °C to 34 °C）进行稀释



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies

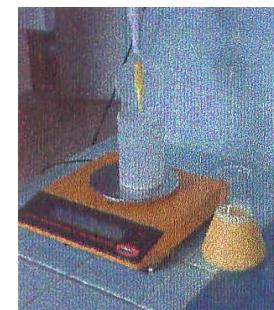


• Centrifugation 离心

- Cool down to 15 °C to 17 °C (59°F to 62,6°F) for 60 to 90 minutes 在60-90分钟内冷却至15 °C to 17 °C



- Centrifuge at 15 °C (59°F) at 800G for 25 minutes 在15 °C条件下以800G的速度离心25分钟



- Remove supernatant by aspiration 吸除悬浮物

- Resuspend the pellet with cooling extender (CE) according the following formula:再加入冷却稀释剂离心

(Total # of sperm cells /3) – WT of pellet = volume of cooling extender 冷却稀释剂
计算公式：总精子数 ÷ 3 - 样本重量 = 冷却稀释剂体积

世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



- **CENTRIFUGATION CUSHION : MAXIFREEZE离心保护剂**



1000G for 20 Mins.

世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Cooling 冷却

- Cool down to 4 °C (39,2°F) for 90 minutes

在平衡柜里90分钟平衡至4 °C

- Add freezing extender (FE) at 4 °C (39,2°F)

4 °C条件下添加冷冻稀释剂 公式如下：

$$\text{Volume of FE} = \text{volume of CE} + \text{volume of pellet}$$

冷冻稀释剂体积=冷却稀释剂体积+样本体积

- Fill printed 0,5ml Fench straw with MRS1 filling machine at 4 °C (39,2°F)

在4 °C的平衡柜里进行灌装，使用已打码的0.5ml卡苏冻精细管



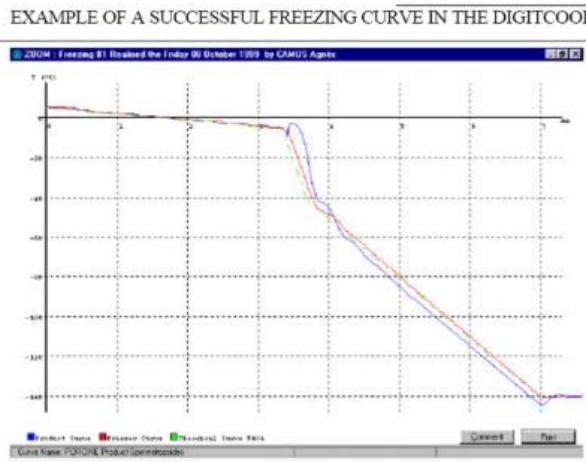


• Freezing冷冻

- Prepare the freezing racks

准备好冷冻托架

- Freeze in a programmable freezer according to IMV freezing curve
用程序化冷冻仪按照卡苏冻精曲线进行冷冻



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Storage of Frozen semen 冻精保存

- Collect the frozen straws

取出冻精细管



- Store the straws at – 196°C (-320,8°F) in liquid Nitrogen

将冻精细管保存在-196°C的液氮里



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Thawing解冻

- Carefull thawing procedure are needed for frozen Swine semen 猪冻精解冻操作需小心谨慎
- One insemination will be performed with 7 straws 7支冻精/深部输精
- Quikly remove the straw from storage containers 从液氮罐里快速取出冻精细管
- Shake them and plunge them in a water bath at 42 °C (107,6°F) for 20 seconds 甩除多余的液氮放入42°C水浴锅加热20秒
- Dry the straws 擦干细管

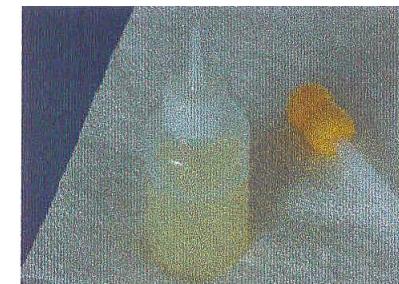
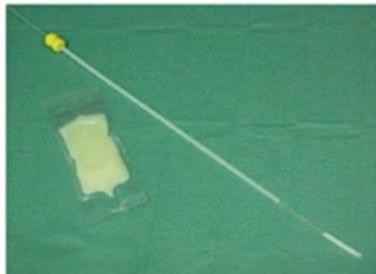


世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Semen preparation for AI 输精前准备

- Cut the straws at the sealed end
减掉细管封口端
- Release their contents into the thawing extender at 34°C (93,2°F)
将冻精加入34°C的解冻稀释液中

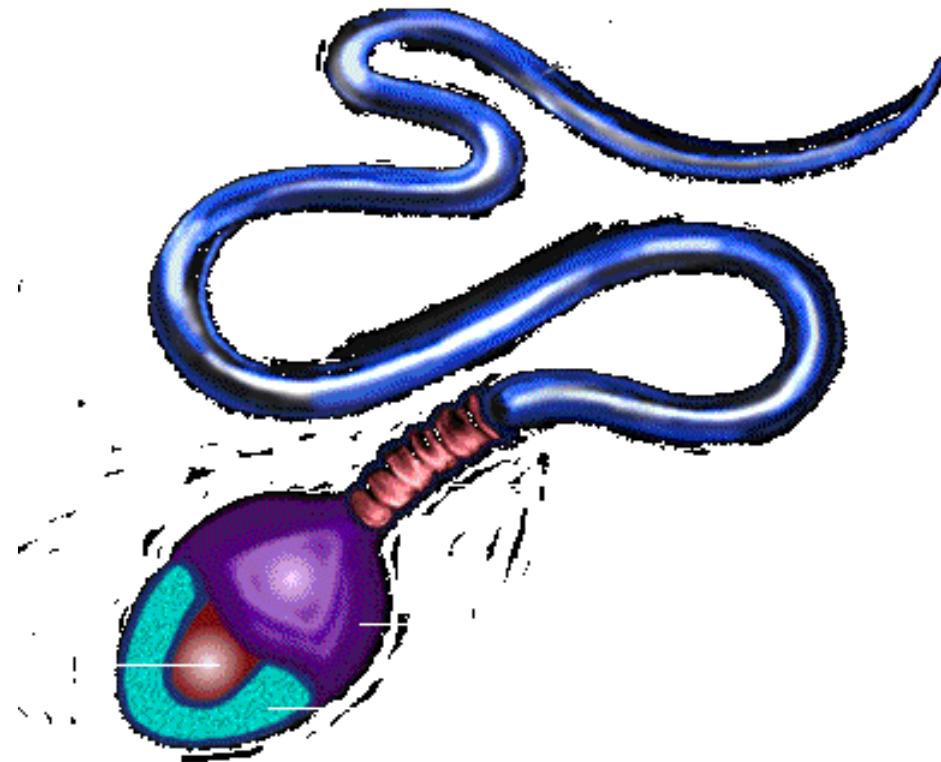


- Perform AI within one hour 一小时内输精
- Minimum requirement for AI >40% Motile Cells
冻精输精最低标准: >40%活力

世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



- CASA SYSTEM for Motility and Morphology semen assessment 使用CASA系统检测精子活力和形态

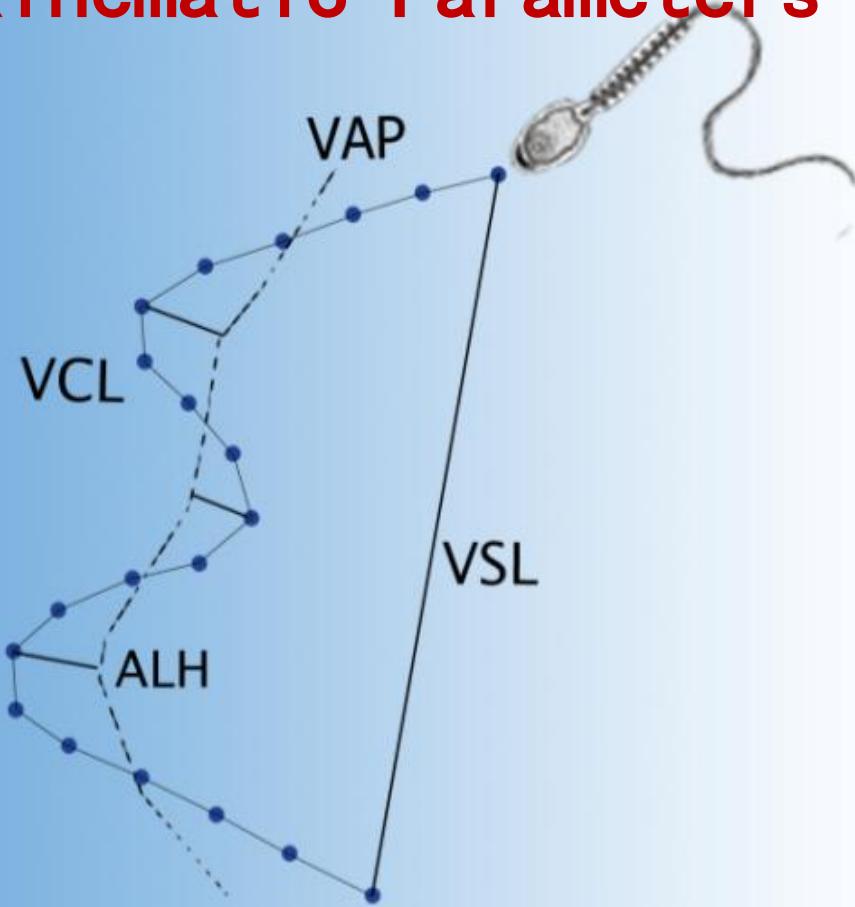


世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• 精子的运动学参数

kinematic Parameters



$$STR = \frac{VSL}{VAP}$$

$$LIN = \frac{VSL}{VCL}$$

$$WOB = \frac{VAP}{VCL}$$

WOB 摆动比例

DAP 平均运动距离

DSL 直线运动距离

DCL 曲线运动距离

VAP 平均运动速率

VSL 直线运动速率

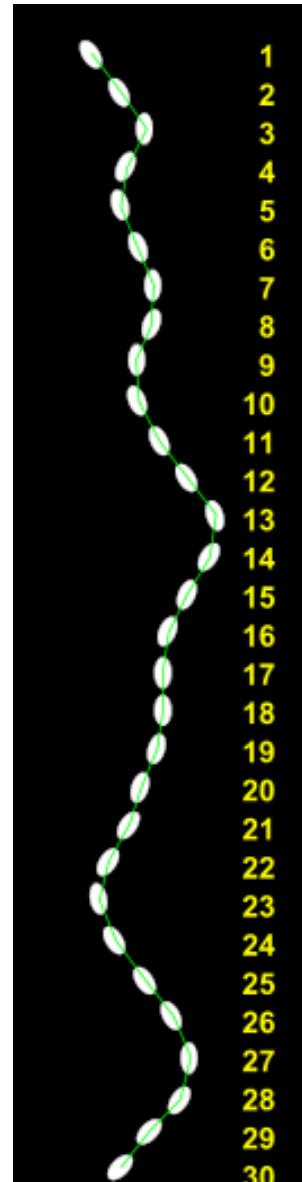
VCL 曲线运动速率

STR 直线运动比例

LIN 线性运动比例

ALH 头部摆动振幅

BCF 交叉运动频率





SCA
PRODUCTION
SPERM CLASS ANALYZER

• SCA Production

- 3ul精液
- 自动计算-精子密度Concentration
- 自动计算-精子活力Motility
- 自动计算-需添加稀释液数量
Volume - Extender
- 自动计算-分装瓶数 No. of doses
- 自动生成报表（图像/视频）Report
- 数据存档，分析公猪生产性能
Data storage



硬件配置：

- 尼康显微镜
- 尼康显微镜相差装置
- 巴斯勒相机
- 进口图像采集卡
- 品牌电脑

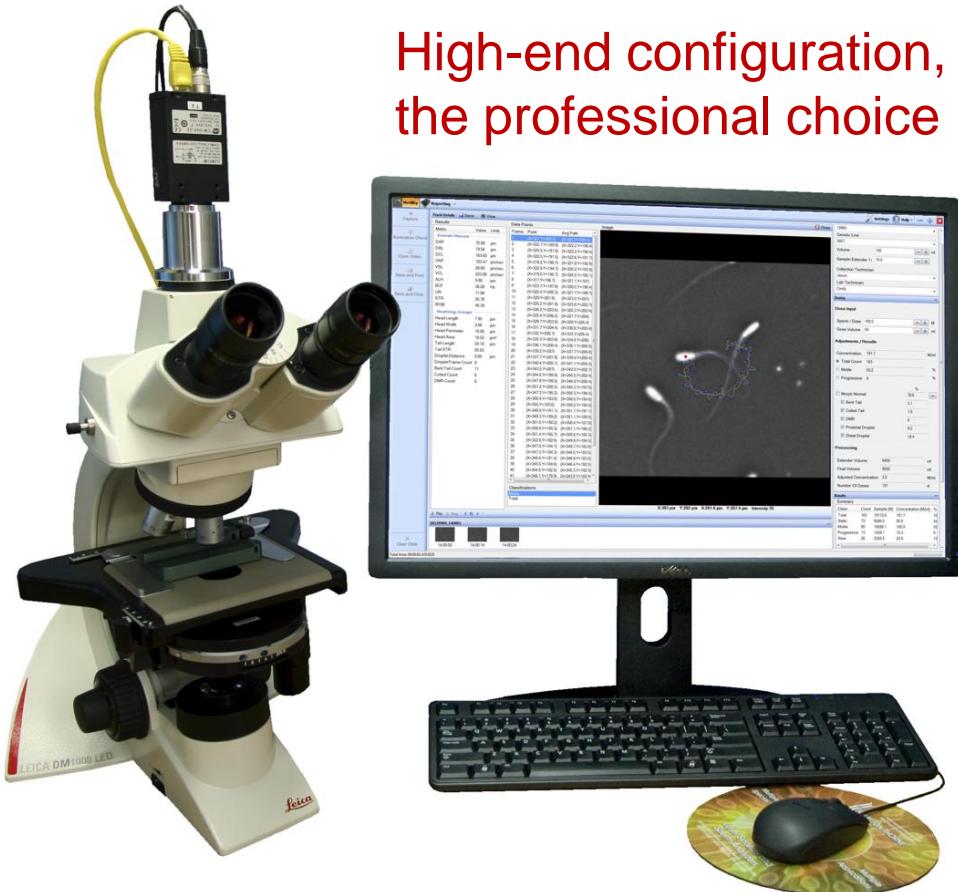
满足精液生产需求/高性价比

High Cost-Effective for Semen Production



• CEROS II 高端配置

High-end configuration,
the professional choice

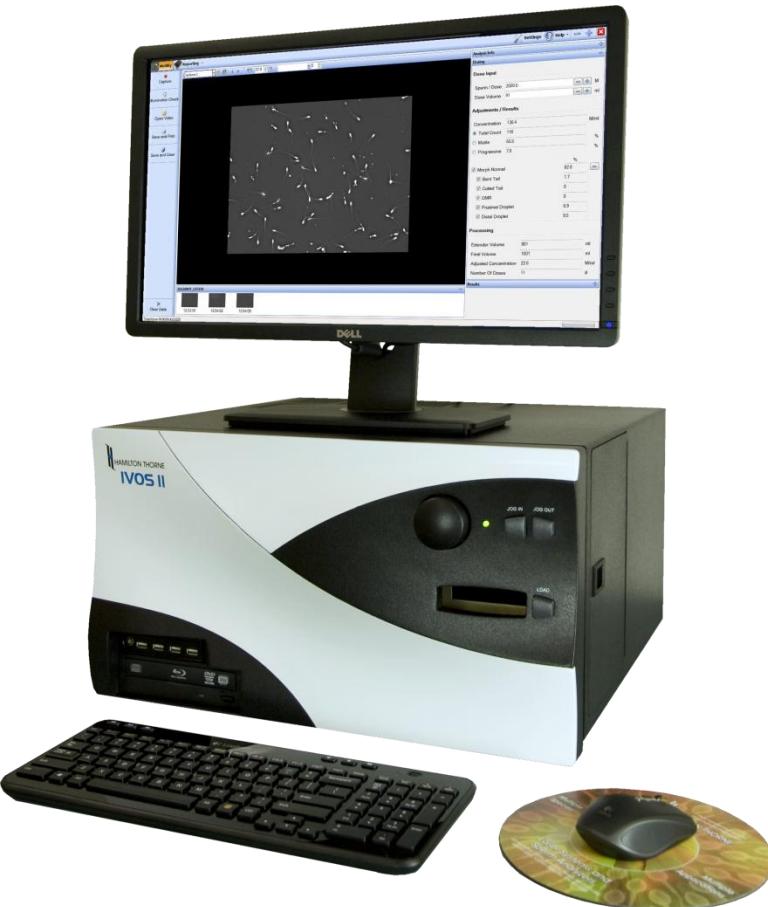


专业之选

- 蔡司三目相差显微镜
- 公猪精子分析专用软件
Boar Breeders II
- 品高分辨率单色数码CCD
摄像机
- 品MiniTherm温控平台，
卡片夹合设计
- 品牌Dell电脑
- 23英寸宽屏高清显示器
(1920X1080)



• IVOS II 唯一一款一体化集成设计



Integrated Design

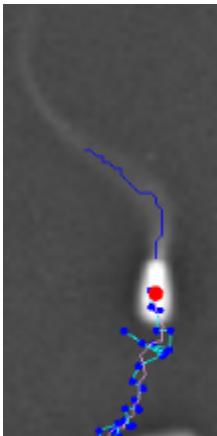
- 显微成像系统+计算机集成一体
- 暗室环境避免光线对成像的干扰，视野清晰，高质画面
- 特别适合荧光染色等专业指标分析
- 专配蔡司10X负相差物镜
- 自动调焦、更换视野，高度自动化
- 内置嵌入式温控平台（轨道型）
- 23英寸宽屏高清显示器数
(1920X1080)



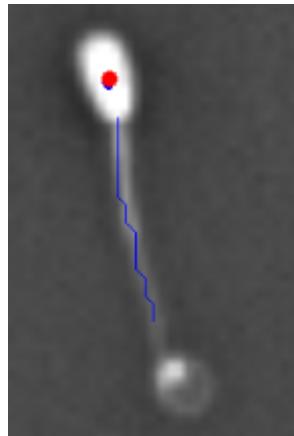
• 精子测定指标

Index of sperm analysis

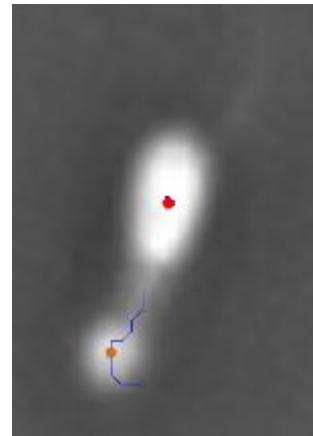
- ◆ 密度Concentration /活力Motility: 总的, 静止的, 活动的, 直线的, 慢运动的
- ◆ 畸形率Morphology: 弯尾, 卷尾, DMR, 近/远端原生质滴
- ◆ 推荐稀释份数、添加稀释液剂量 Volume of extender, No. of doses
- ◆ 精子运动轨迹标示及回放 Tracking
- ◆ 单精子分析Individual sperm analysis: 头部长、宽、周长、面积、运动学参数



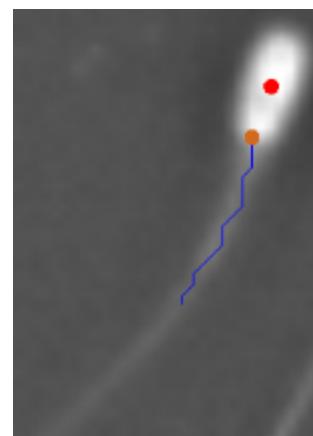
Bent tail



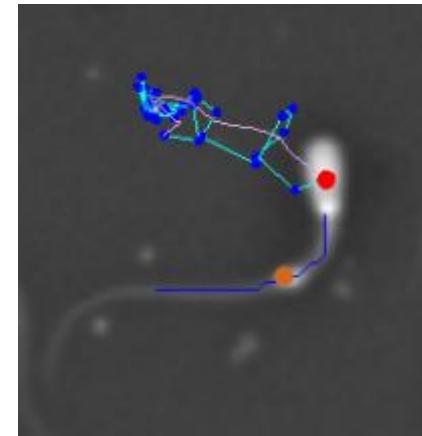
Coiled tail



Distal Midpiece Reflex



Proximal droplet



Distal droplet

弯 尾

卷 尾

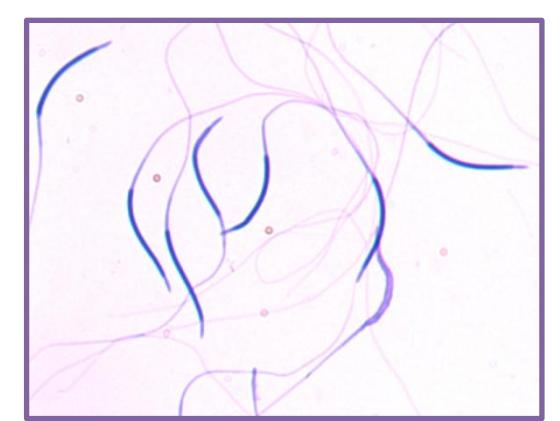
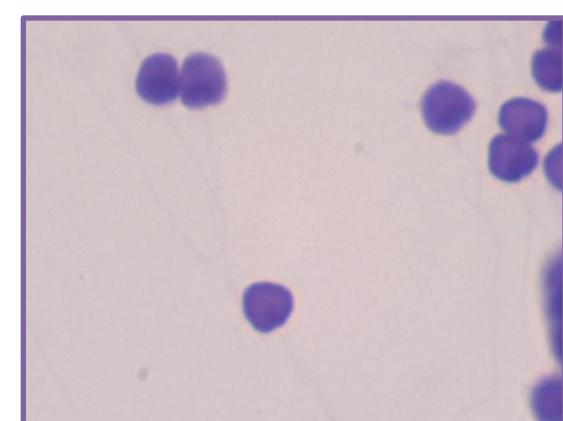
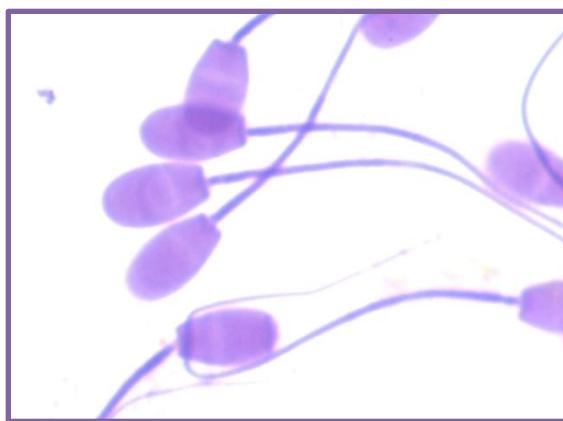
DMR

近端原生质滴

远端原生质滴³³

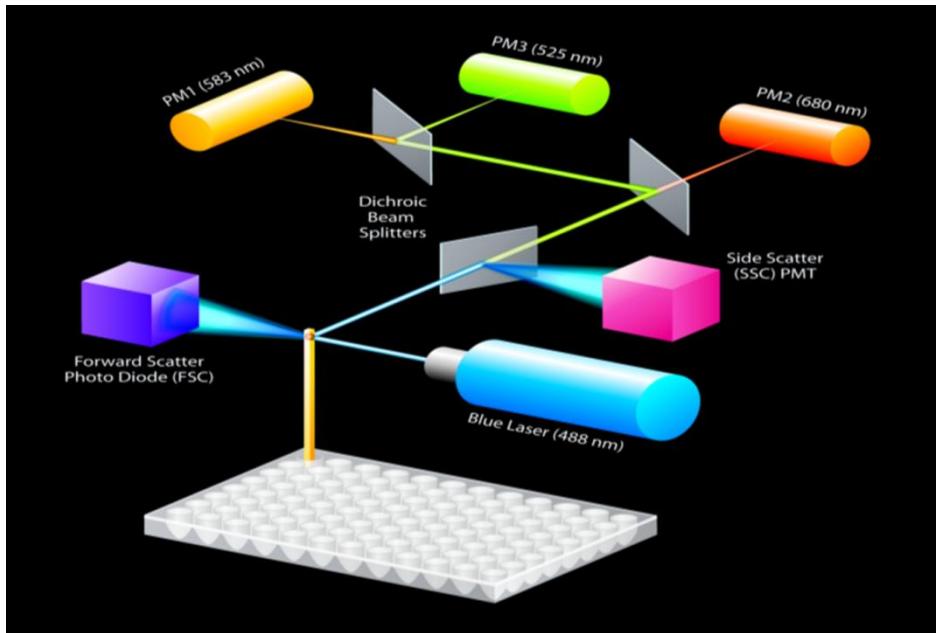


•染色后精子形态 Morphology of Stained Sperm





• EasyCyte种公猪繁殖性能测定系统-科研级



细菌计数
Bacteria Counting

密度, 活率, 顶体, 线粒体, 质膜完整性.....
Concentration, Viability, Acrosome, Mitochondria, Membrane integrity

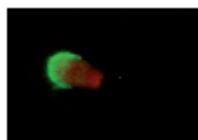


• EasyCyte 测定指标

活率和顶体完整性

Viability & Acrosome integrity assay

- % of dead sperm (PI red): membrane status
- % of reacted acrosome (PNA-FITC Green) : acrosome status



Viability 活率

- Indicator of sperm membrane integrity
- Difference between live sperm (green) SYBR14/dead (red) PI



活精

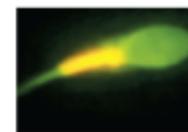


死精

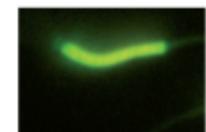
线粒体活性

Mitochondrial activity assay

- Polarized Mitochondria (JC1 orange); depolarized Mitochondria (JC 1 green)



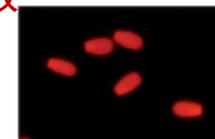
High potential



Low potential

Sperm count total number of sperm cells

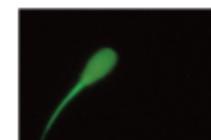
精子计数



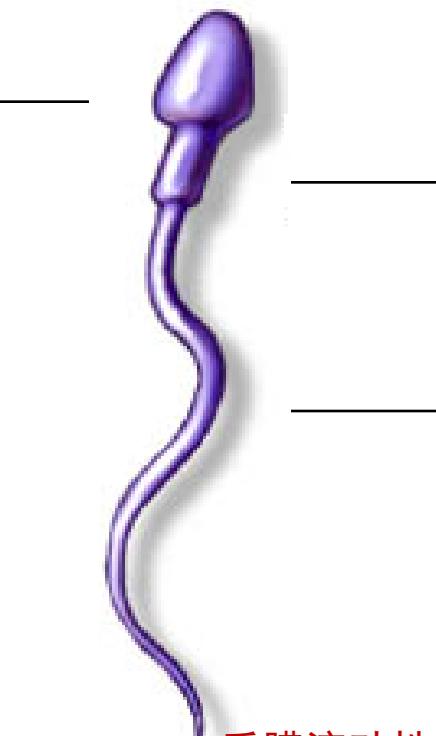
氧化水平

Oxidation level test

- Detection of free radicals in spermatozoa
- H2DCFDA (green)



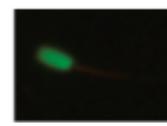
Strongly oxidized



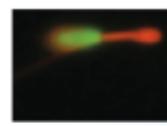
质膜流动性

Membrane Fluidity test

- Phospholipid disorders (Merocyanine red)



Normal organization



Membrane phospholipid disorder



• Gilt/Sow management 初/经产母猪管理

- Heat detection is the most critical factor in order to be successfull with AI.

查情是人工授精成功与否的关键

- The importance of both the Oestrus detection and the time of AI become even more important when frozen semen is used
发情鉴定和配种时机对冻精输精配种格外重要



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Pre-mating Period 配种前

- Flush feed Gilts/Sows 7-14 days prior to the expected breeding date.
在预期配种日前7-14天加大饲喂量
- Loss of body condition during lactation can have very negative effects on sow fertility after weaning. Ideally inseminate sows with 16 to 20 mm of back fat 哺乳期体重下降可能对断奶母猪受胎率有负面影响，背膘厚度在16-20mm最为理想。
- A lighting schedule should be implemented. 14-16 hours at 300 LUX in weaned sows 建议对断奶母猪进行如下强度光照：每天14-16小时，300勒克斯/ m^2
- Keep the back of the crade very clean to avoid infection
保持定位栏清洁，避免感染



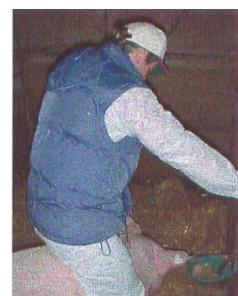
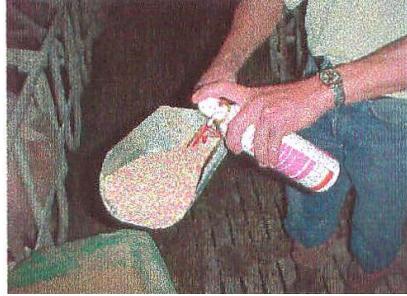
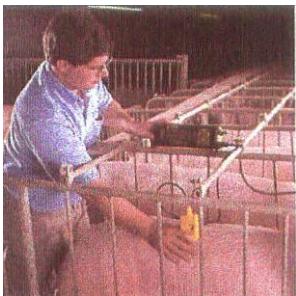
世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Heat detection 查情

- Start heat detection 2,5 days after weaning for first and multiple parity sows or the day after finishing the oral progestagen Allyl Trembolone (Regumate) treatment in Gilts

头胎和多胎母猪断奶后2.5天开始查情，后备母猪停止口服同期发情药物之后开始查情



- Detect heat **twice a day** in the morning and in the afternoon, 30 minutes after feeding

每天早上和下午各查情一次，每次查情在喂食半小时后进行

世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Time of mating 配种时机

- For 80% of the sow herd, estrus starts between day 4 and 5 after weaning.
80%的母猪在断奶后4-5天发情
- Ovulation will occur between day 6 and 7 (also for 80% of the herd).
断奶后6-7天排卵（80%断奶母猪）
- A strong correlation exists between the time of ovulation and the duration of the estrus. 排卵时间与发情持续时间有着密切的联系
- Sows are classified in early, regular and late coming according to their weaning to estrus interval.

根据母猪断奶后发情的时间间隔，可以分类为：提前发情、正常发情、推迟发情



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Time of mating 配种时机

- Often sows coming into estrus early after weaning will show a prolonged heat period (72-96 hours) associated with delayed ovulation (48-72 hours) after beginning of the estrus

通常提前发情的断奶母猪持续较长发情时间与发情后排卵推迟有关系

- For sows coming into estrus early after weaning and for all gilts, when using frozen semen, 3 AI's should be performed

对于提前发情的断奶母猪和后备母猪，如果使用冻精输精配种，建议配3次



世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



• Optimum time for AI 最佳配种时机

1) Sows in heat between day 0 and 4 after weaning: 断奶后4天内发情

1st AI	18-24h
2nd AI	30-36h
3rd AI	42-48h

2) Sows in heat between day 5 and 6 after weaning: 断奶后5-6天发情

1st AI	12-18h
2nd AI	24-30h

3) Sows in heat between day 6 and 7 after weaning: 断奶后6-7天发情

1st AI	0 h
2nd AI	12h

Do not inseminate sows with frozen semen if the weaning to estrus interval is more than 7 days

断奶到发情间隔超过7天，不建议使用冻精输精

4) Gilts 后备母猪

1st AI	0 h
2nd AI	12 h
3rd AI	24 h

- The reference above are for reference only and individual breeder should collect information about estrus duration within their own system.
- The information collected should be used to develop specific breeding strategies

世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies



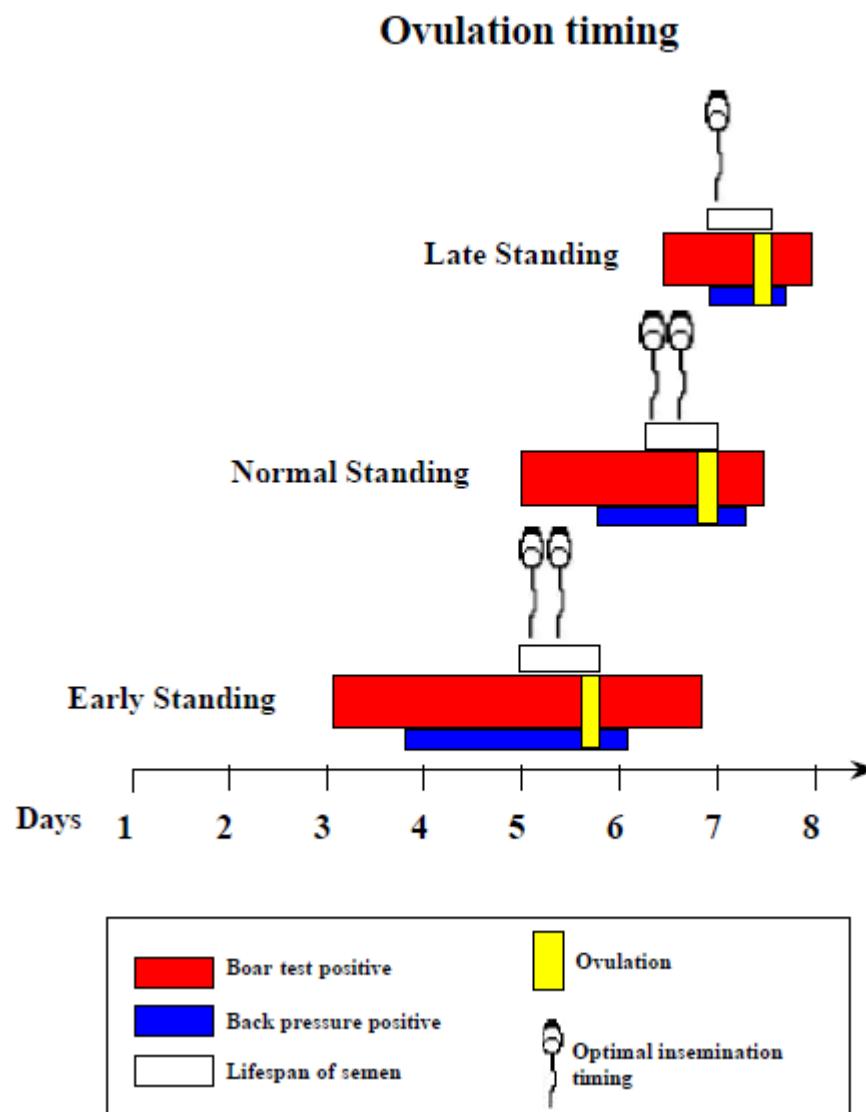
• Results 使用冻精输精数据

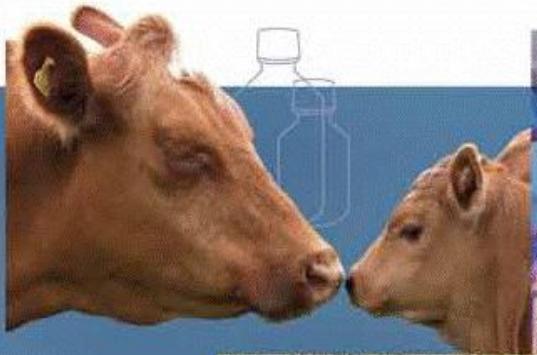
FIELD TRIAL (PCAI) 使用深部输精的猪场生产实验数据

Batch 实验批次	Spz/dose 总精子数	Fertility 受胎率	Prolif. 生产指标
5x0,5 ml	3,8 . 10 9	100 (22)	11,4 (0,7)
10x 0.25 ml	3,8 . 10 9	90,9 (22)	11,8 (0,7)
5x 0,25ml	1,9 . 10 9	86,4 (22)	11,1 (0,8)

G.Delhomme et al, feb 2001 , unpublished

世界生物繁殖技术的先驱
World Leader in Reproduction Biotechnologies





**THANK YOU
FOR YOUR ATTENTION**