

優良品種代代相傳

福昌豬場

好種豬要豬種好



福昌種豬遺傳 AI 中心

FORTUNE SWINE GENETICS AI CENTER

公豬精液生產之生物安全 與新的人工授精技術

Biosafety of Boar Semen Production and New Artificial Insemination Technology

台灣福昌集團

楊杰 總經理



臺灣福昌集團

FORMOSA FORTUNE GROUP

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福昌種豬遺傳 AI 中心

FORTUNE SWINE GENETICS AI CENTER



福昌豬場

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FA CHANG ENTERPRISE CO. LTD.

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ISO 9001

國際品質認證

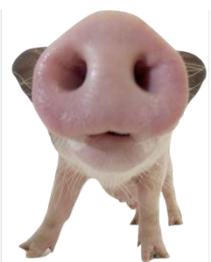


精液產品的生產與人工授精成效之關鍵，在於精液產品品質與安全性

壹、公豬生物安全原則一

以公豬健康維護為最高原則

貳、精液產品的品質提升方案



壹、公豬生物安全原則

外界環境

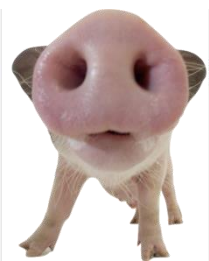
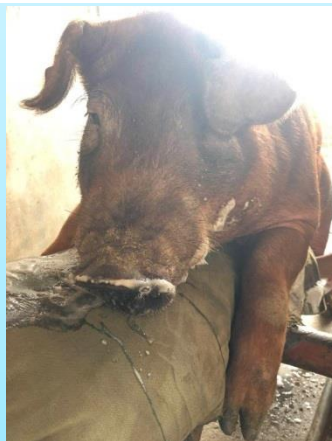
一、隔絕傳播路徑

場區內部

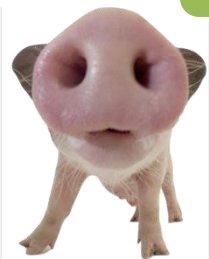
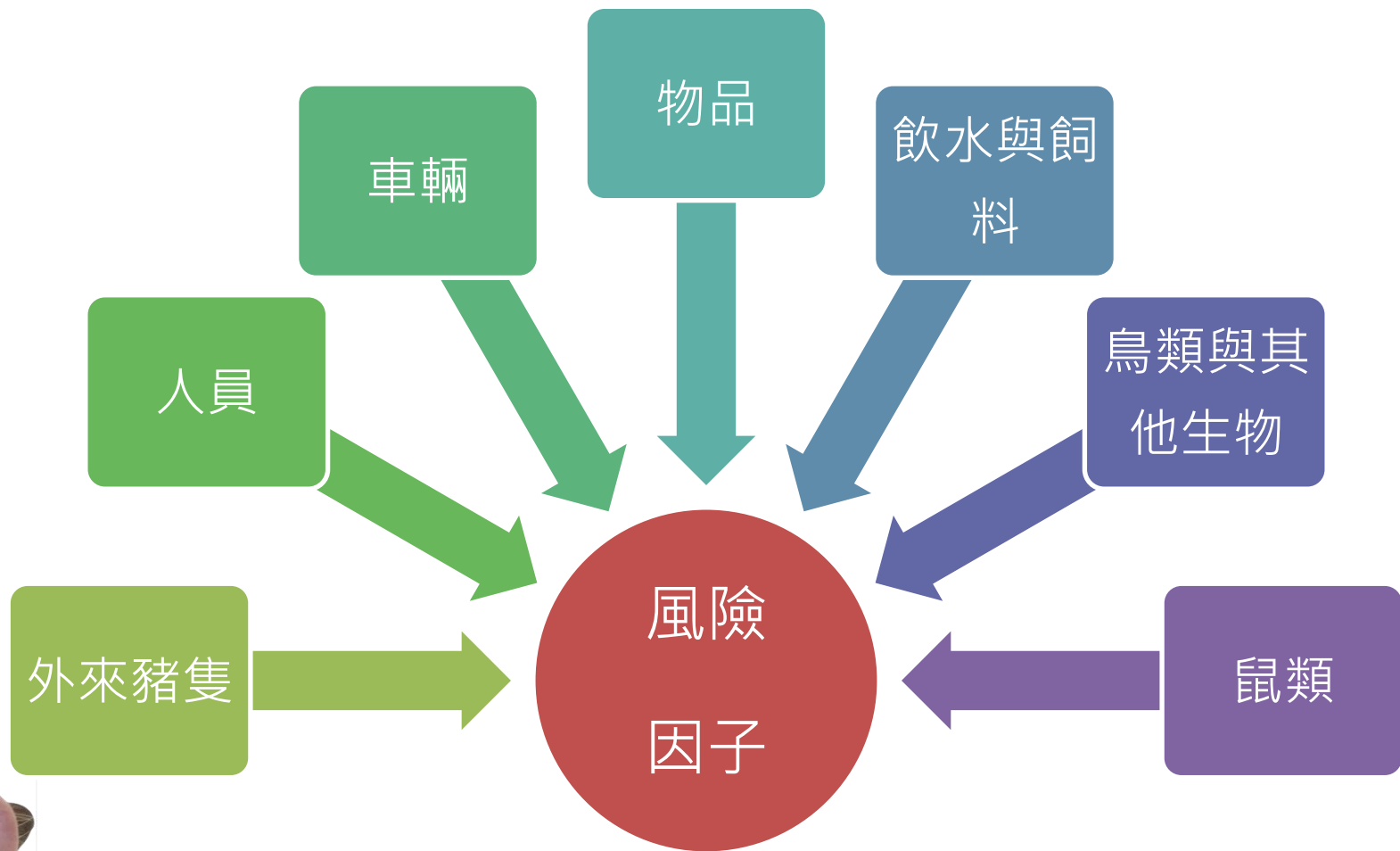
二、降低病原濃度與感染風險

動物自身

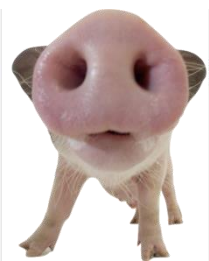
三、動物免疫與健康維持



外界環境風險因子



降低病原濃度與感染風險



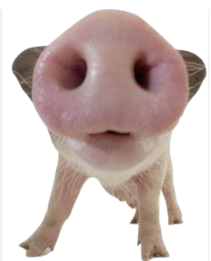
品質管制系統導入



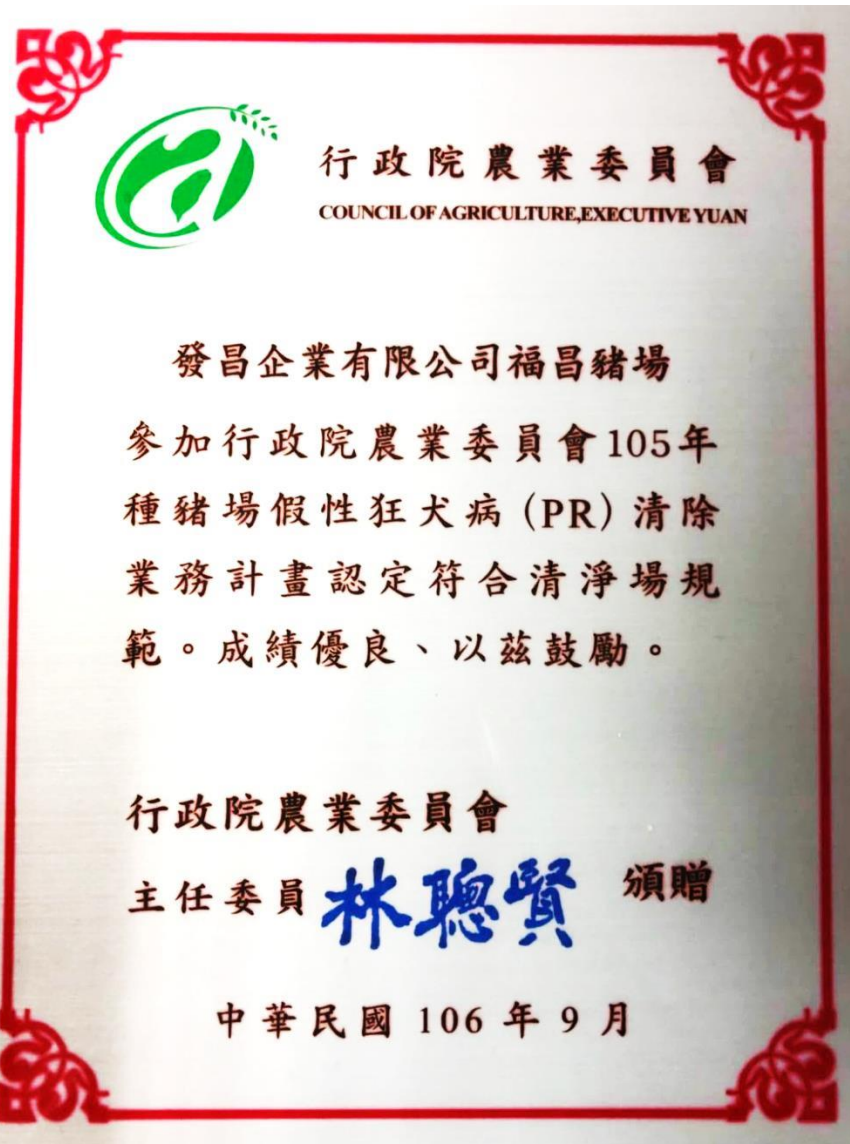
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- 7301設備編號作業標準書-20170819.doc
- 7302設備操作與校正作業標準書-20170823.doc
- 7303發電機操作作業標準書-20170728.doc
- 7304鑄土機操作作業標準書-20170728.doc
- 7305載貨車輛操作作業標準書-20170728.doc
- 7401危機處理作業標準書-20170728.doc
- 7402豬場清潔消毒作業標準書-20170822.doc
- 7403人員進出場消毒作業標準書-20170728.doc
- 7501污水處理場日常作業標準書-20170728.doc
- 7502沉砂池檢查作業標準書-20170728.doc
- 7503固液分離機檢查作業標準書-20170728.doc
- 7504厭氣槽檢查作業標準書-20170728.doc
- 7505曝氣槽檢查作業標準書-20170728.doc
- 7506終沉池檢查作業標準書-20170728.doc
- 7507放流水放流作業標準書-20170728.doc
- 7508汙泥脫水機作業標準書-20170728.doc
- 8101母豬發情觀察作業標準書-20170728.doc
- 8102種公豬採精作業標準書-20170728.doc
- 8103人工授精作業標準書-20170826修改.doc
- 8104飼養作業標準書-20170728.doc
- 8105種豬防疫作業標準書-20170626.doc
- 8106種公、母登錄作業標準書-20170728.doc
- 8107母豬配種異常處理作業標準書-20170728.doc
- 8141斃死豬化製處理作業標準書-20170728.doc
- 8201分娩舍母豬分娩作業標準書-20170728.doc
- 8202分娩舍仔豬管理作業標準書-20170728.doc
- 8203仔豬耳號編剪作業標準書-20170728.doc
- 8204分娩舍溫控作業標準書-20170728.doc
- 8301仔豬離乳入舍作業標準書-20170728.doc
- 8302保育舍溫控作業標準書-20170728.doc
- 8303種豬畜養異常處理作業標準書-20170728.doc
- 8401場內檢定作業標準書-20170728.doc
- 8402種豬外觀選拔標準書-20170728.doc



健康狀態



特定病源清除



- PR 豬偽狂犬病
- HC 豬瘟
- ASF 非洲豬瘟
- FMD 口蹄疫
- JE 日本腦炎
- Brucella suis 布氏桿菌...

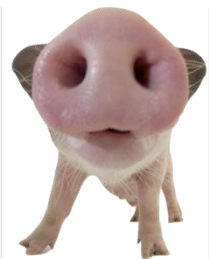
公豬精液定期監測

檢測單位：張文發教授—國立中興大學
獸醫學院動物疾病診斷中心

檢測項目：

分生檢測

細菌學檢測



公豬精液委外檢測

國立中興大學獸醫學院動物疾病診斷中心 Animal Disease Diagnostic Center
College of Veterinary Medicine, NCMU

分子生物學檢驗報告

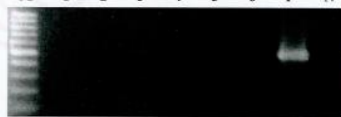
病例號碼: ADDC 18-1800 檢驗編號: MB-P-2913 送檢日期: 107.05.10
送檢單位: 福昌豬場 送檢人: 檢驗日期: 107.06.06

檢驗項目	檢體	檢驗內容	樣品數
<input checked="" type="checkbox"/> PCR	精液	PRV, PCV2	6
<input checked="" type="checkbox"/> RT-PCR	精液	PRRSV	6

檢驗結果: 所有檢體均為陰性反應

PCR for PRV and PCV2

M 1 2 3 4 5 6 P N



← PRV gE: 500



← PCV2: 263

說明:

- 1: D155-1 2: D1093-6
3: D1107-2 4: D1606-2
5: D1761-1 6: Y1256-2
P: 陽性對照
N: 陰性對照
M: DNA marker

RT-PCR for PRRSV and internal control (β-actin)

M 1 2 3 4 5 6 P N



← PRRSV: 536



← β-actin: 268

國立中興大學獸醫學院動物疾病診斷中心 Animal Disease Diagnostic Center
College of Veterinary Medicine, NCMU

臨床微生物學檢驗報告

病例號碼: ADDC18-1800 檢驗編號: 送檢日期: 107.05.10
送檢單位: 福昌豬場 送檢人: 檢驗日期: 107.05.10

檢驗項目	檢體	檢驗內容	樣品數
	豬	精液	6

檢驗結果:

1. 細菌分離鑑定結果

樣品編號	樣品來源	細菌
1	精液(D1606-2)	未發現細菌生長
2	精液(D1107-2)	未發現細菌生長
3	精液(D1761-1)	未發現細菌生長
4	精液(D155-1)	未發現細菌生長
5	精液(D1093-6)	未發現細菌生長
6	精液(Y1256-2)	未發現細菌生長

備註: 未發現細菌生長之可能因素

1. 送檢之精液檢體中含菌量過少
2. 採精前動物曾服用過抗生素
3. 送檢過程中精液樣品未適當保存以致細菌死亡

動物疾病
診斷中心



檢驗室
主任簽章

檢驗黃千祚

檢驗人員
簽章

獸醫師吳金英

動物疾病
診斷中心



檢驗室
主任簽章

微生物檢驗室陳德勳

檢驗人員
簽章

邱麗卿

貳、精液產品的品質提升方案

精液產品生產流程



Semen collection

精液收集



Semen analysis

精液分析



Semen preparation

精液製備

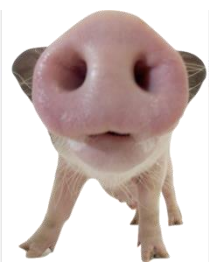


Semen packaging

精液包裝



豬 COLLECTIS® 精液自動採集系統



➤ 自動化控制箱

控制假陰道每30秒鐘收縮
2次，以刺激公豬興奮

內置程式控制操作，採精
手法統一



➤ 可調假母台

帶假陰道移動



➤ 仿生假陰道

柔軟有彈性，觸感溫暖；
內部螺紋設計

一次性耗材，減少污染
機率

CASA 電腦輔助精子分析系統

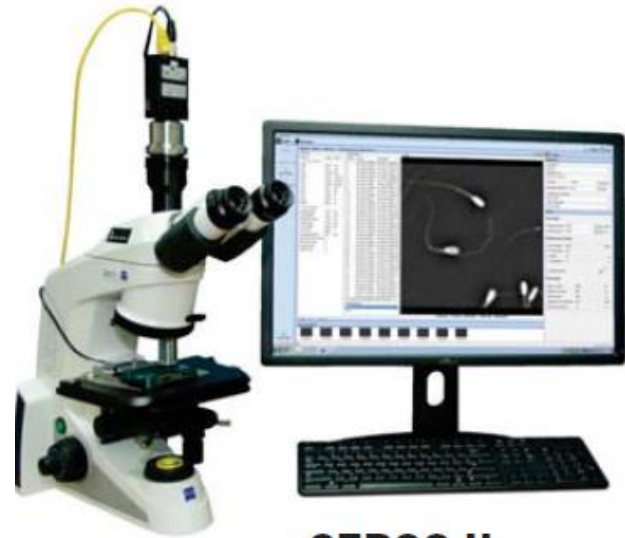


IVOS II

Ref. 024911: IVOS II

Ref. 024910: IVOS II fluorescence

- Built-in system
- Automated heated stage
- Fluorescence
- Automated morphology

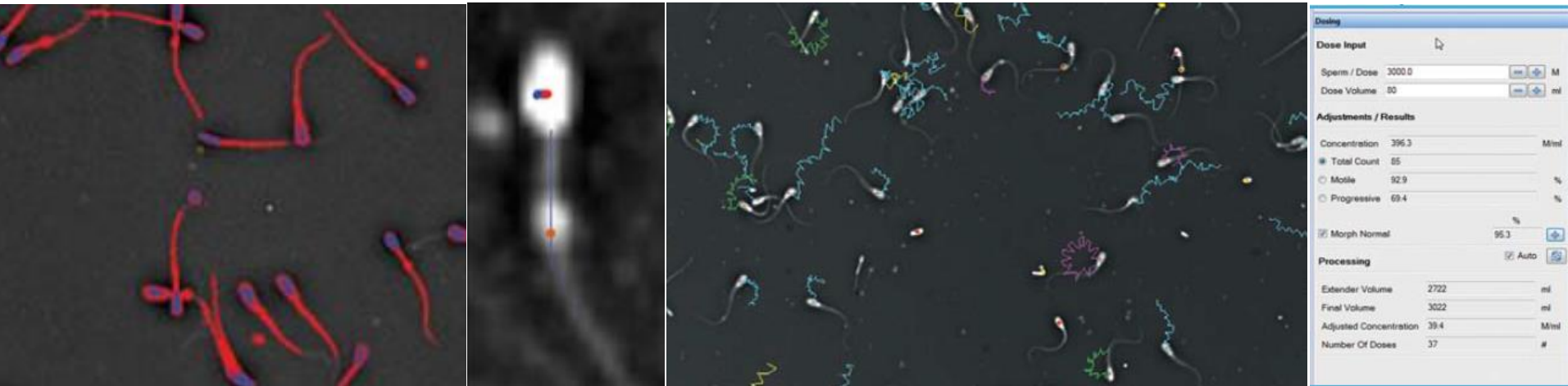


CEROS II

Ref. 024905: CEROS II Zeiss

Ref. 024904: CEROS II Olympus

- Manual heated stage
- Automated morphology



Counts, concentration and percentages

Total, static, motile, progressive and slow cells

Kinematic measurements

DAP, DSL, DCL, VAP, VSL, VCL, ALH, STR, LIN, BCF, WOB
(Average, SD, Median)

Doses

- Extender volume
- Final volume
- Number of doses

Morphometric characteristics

Head length, width, perimeter and area. Tail length and straightness. Droplet distance.

Automated morphology

- Distal droplets
- Proximal droplets
- Distal Midpiece Reflexes
- Coiled tails
- Bent tails



easyCyte

Advanced semen quality
assessment by flow cytometry.

發現精子的內在美



▀ Viability

Membrane permeability is an indicator of cellular viability. Through membrane integrity, this test indicates percentage of viable spermatozoa.



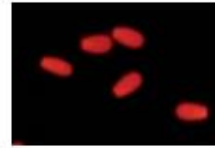
Live



Dead

▀ Sperm count

Assess accurate cell numbers and population percentages without reference beads.



▀ Oxidation level

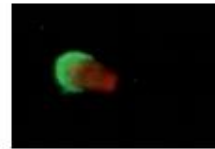
This assay measures the intracellular level of Reactive Oxygen Species needed for sperm function but that are harmful at a high level.



Strongly oxidized

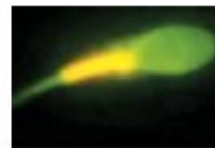
▀ Viability and acrosome integrity

The acrosome is essential for fertilization. A new combination of three stains was developed by IMV. Two of the stains monitor the integrity of the acrosome and of the membrane, simultaneously. The third fluorochrome is sperm-specific and thus allows to remove debris from the analysis.

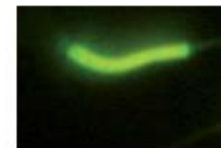


▀ Mitochondria activity

To reach the oocyte, the sperm needs energy which is produced by the mitochondria. This assay analyzes membrane potential (polarized, depolarized) to show the integrity of the mitochondria.



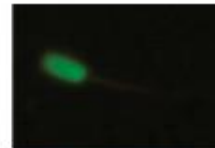
High potential



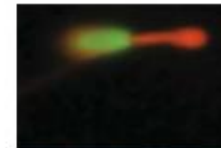
Low potential

▀ Membrane fluidity

Membrane fluidity is critical for proper cell function and exchange with the outside environment. This assay assesses phospholipid disorder in the membrane.









Normal organization



Membrane phospholipid disorder

保存稀釋液



	Storage Time (days)	Antibiotics	CEE ⁺	Advanced Antioxidant	Blood protein free	Buffer	Bio Activator	Bio Shield	Semen storage t (C°)		Presentation
									Min	Max	
BTS	3	++			■	+			16	18	Powder
PRIMXcell	4	+++	■		■	+			16	18	Powder
NUTRIXcell	6	+++	■	+	■	++			16	18	Powder
NUTRIXcell+	6	+++	■	+++	■	++	 		12	18	Powder
TRIXcell	7	++++		++		+++			10	25	Powder
TRIXcell+	7	++++	■	++	■	+++			12	18	Powder
SAFEcell+	7	++		+++		+++			10	25	Liquid





Bioactivator is a biological compound which amplifies Platelet Activating Factors (PAFS) biosynthesis. PAFS stimulate sperm motility, assist oocyte penetration and ultimately improve fertility. It has been shown that high-fertility boars have a higher level of PAFS than boars with low fertility (Cheminaid et al, 2002).

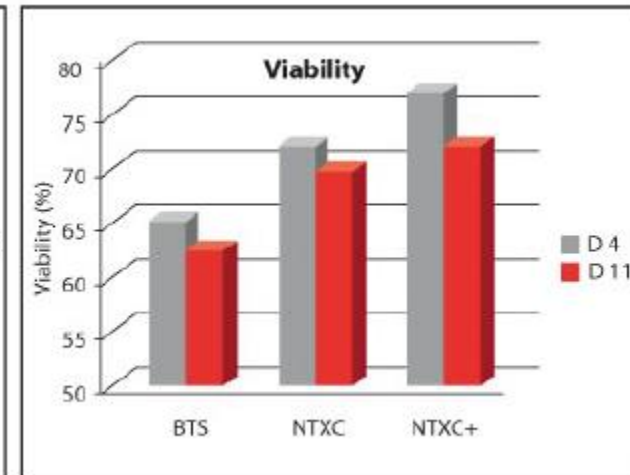
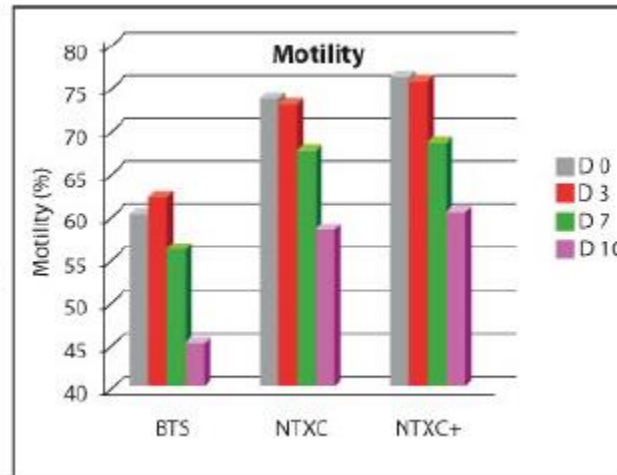
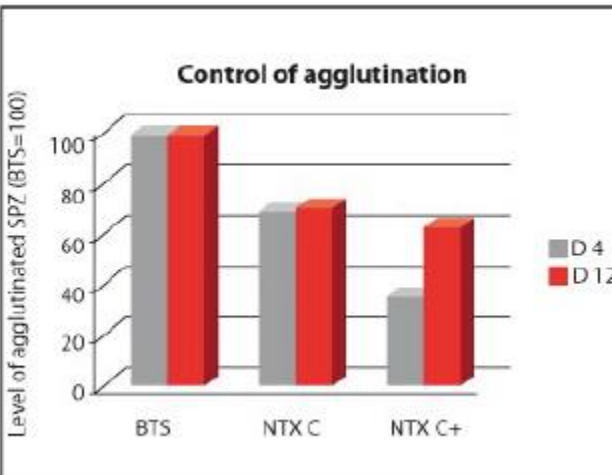
	# Sows inseminated	% FR	BA	Fertility Index	
Control	356	78.37	11.74	920	+ 6.7%
Control + BIO ACTIVATOR	360	84.72	11.6	982	

This unique protein compound protects membranes and maintains their structure over time. It also acts as a fatty acid transport agent. These combined properties offer real advantages:

- protection against temperature variations and mechanical stress
- increased protection against oxidation
- slower capacitation induction
- improved real motility (% of progressive spermatozoa)
- improved agglutination control



	# Sows inseminated	% FR	BA	Fertility Index	
Control	163 453	88	14	1 232	+ 8.5%
Control + BIO SHIELD	44 370	91	14.7	1 337	



BactiGuard 抗菌包裝材

Bacterial contamination of boar semen affects litter size

Luis O. Maroto Martínez et al., 2010



42 boars
39 contaminated boars

+



9 sows per boar

=

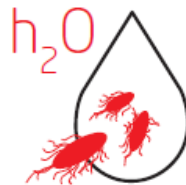
If *E. coli* > 3.5×10^3 CFU/ml



Decrease of 2.53 to 3.35
piglets per litter

The impact of bacteriospermia on boar sperm storage and reproductive performance

C.E. Kuster,*, G.C. Althouse, 2015



+



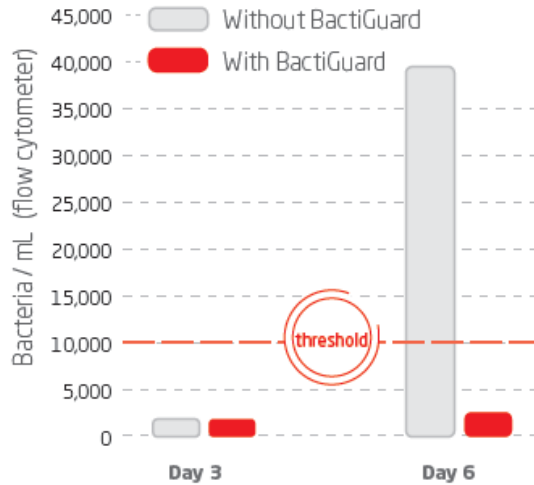
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Vaginal discharge: 8 to 15%

Reduction in
conception rates: 6 to 12%

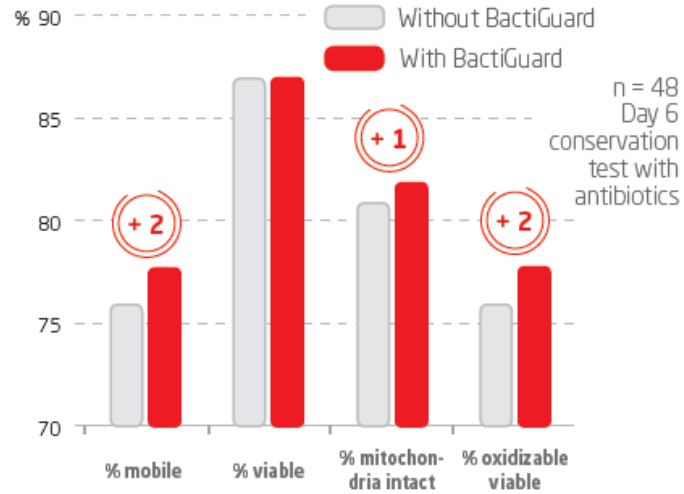
Number of boars: 160 - Number of sows: 21,000

BactiBag very substantially limits bacterial multiplication (a)

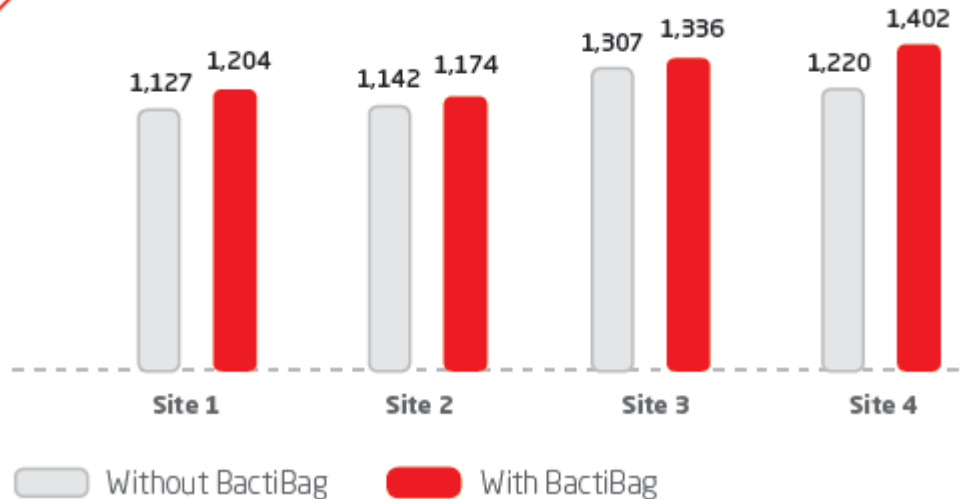


— Beyond this threshold, there may be an impact on reproductive quality (b)

BactiBag preserves the quality of sperm



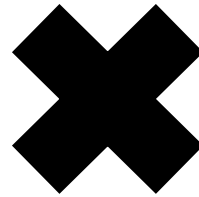
Fertility index
(fertility rate x total born piglets)



豬隻生產繁育專家



臺灣福昌集團
FORMOSA FORTUNE GROUP





Thank for Your
Attention