



如何才能更安全更有效的防控PRRS

How can we prevent and control PRRS
more safely and effectively?

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Field trial of PRRS inactivated vaccine

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PRRS防控的挑战

The significance of PRRS prevention and control

■ 国内PRRSV流行优势毒株经历了三个阶段：

At present, PRRSV predominant strains have gone through three stages in China.

- 1.经典型PRRSV：1995年-2006年 Classical PRRSV：1995-2006
- 2.HP-PRRSV：2006年-2014年 HP-PRRSV：2006-2014
- 3.NADC30-like-PRRSV：2014年至今 NADC30-like-PRRSV：2014 to nowadays

新流行毒株NADC30-like感染的主要临床表现:

The main clinical manifestations of NADC30-like infection in new epidemic strains:

- 母猪繁殖障碍 Reproductive disorder for sow
 - 流产、早产 Abortion, premature delivery
 - 不育 (返情、后备猪不发情) Infertility (return to estrus, reserve swine fail to observe estrus)
- 保育仔猪呼吸障碍、运动障碍 Breathing disorder and dyskinesia for nursery piglet
 - 消瘦、衰弱 Weight loss, weakness
 - 严重继发感染 Severe secondary infection
 - 高死亡率 High death rate

各种弱毒疫苗对其免疫保护均不理想。

Various attenuated vaccines are unsatisfactory for immune protection.

PRRS疫苗的免疫挑战:

The immune challenge with PRRS vaccine:

- PRRSV弱毒活疫苗在生产实践中的应用，加速了PRRSV的变异与重组，特点为：

The application of PRRSV attenuated vaccine in practice has accelerated the variation and recombination of PRRSV.

- 变异广泛性 Extensive variability
- 毒株多样性 Viral diversity
- 病原复杂性 Pathogen complexity

- 在实际生产实践中，一个猪群中往往有多个流行毒株同时存在或单一存在。

There are often multiple or single epidemic strain(s) present in a herd in practice.

PRRS疫苗的免疫挑战:

The immune challenge with PRRS vaccine:

- 同源基因型的弱毒苗是有效的，但弱毒苗免疫后有一段带毒期；

Attenuated vaccines of homologous genotypes are effective, but have a period of vaccine virus after immunization.

- 猪群机体长期存在PRRSV病毒血症是变异、重组的基础；

The long-term presence of PRRSV viremia in pig herds is the basis for mutation and recombination.

- PRRS弱毒苗因变异、重组等特性，使其安全使用受到了质疑。

PRRS attenuated vaccines have been questioned due to their safety of variability and recombination.

- PRRS灭活苗呢？

What about the PRRS inactivated vaccine?

关于PRRSV灭活疫苗效果

The effect of PRRSV inactivated vaccine

■ 灭活苗是不是更安全更有效的防控方式呢？

Is the inactivated vaccine a safer and more effective way to prevent and control PRRSV ?

- 有的学者认为无效（未测到免疫后中和抗体）

Some scholars believe that it is ineffective , because there is no neutralizing antibody after immunization.

- 《猪病学》10版：通常认为，灭活疫苗的免疫保护较差，但如果与减毒疫苗联合运用或者用于之前感染过PRRSV的猪时，会刺激记忆免疫应答反应并诱导产生良好的中和反应。

Hyoiatrics in 10th edition point out it is generally believed that inactivated vaccines have poor immune protection ,but if used in combination with attenuated vaccines or in pigs that have previously been infected with PRRSV, they can stimulate the immune response and induce good neutralization reaction.

——通过试验证实？

Confirmed by experiment?

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PRRS灭活疫苗（佑蓝宝）免疫攻毒试验（1）

PRRS inactivated vaccine(You Lanbao) immune challenge test(1)

试验目的：

The purpose of the test:

1. 单独使用灭活疫苗的免疫攻毒效果观察；
Observe the effect of immune challenge test on the use of inactivated vaccine alone.
2. 不同免疫组免疫攻毒效果观察。
Observe the effect of immune challenge test of different immunization groups.

1.1 试验设计 Test design

试验分组 Grouping		免 疫 Immunization			攻 毒 Challenge	
序号 NO.	名称 Name	数量 Quantity	免疫剂量 (每头) IMD (per head)	免疫日龄 Immune day age	攻毒时间 time	攻毒剂量 dose
1	转移因子+3倍灭活抗原 Transfer factor+3 times inactivated antigen	11	提前注射: 转移因子2ml 2ml transfer factor 一免: 灭活苗2ml3倍灭活抗原 First immunity: 2ml inactivated vaccines(3 times inactivated antigen)	转移因子:其它组首免第11天 Transfer factor: 11 th day after first immunity in other groups 一免: 其他组二免时 First immunity: second immunity in other groups	二免后28天 28 days after second immunity	第4代血毒, (10 ^{6.4} TCID ₅₀ /ml)。PBS 10倍稀释, 每组按1ml、3ml两个攻毒剂量分别注射 高于国标2.5倍 The 4 th generation blood virus (10 ^{6.4} TCID ₅₀ /ml) was diluted by 10 times and is injected 1ml and 3ml respectively in each group. 2.5 times than the national standard.
2	3倍灭活抗原+3倍灭活抗原 3 times inactivated antigen +3 times inactivated antigen	11	首免: 灭活苗2ml (3倍灭活抗原) 二免: 灭活苗2ml (3倍灭活抗原) First immunity: 2ml inactivated vaccines(3 times inactivated antigen) Second immunity: 2ml inactivated vaccines(3 times inactivated antigen)	首免: 5周龄仔猪 二免: 首免后3周 First immunity:5 weeks Second immunity: third week after first immunity		

1.1 试验设计 Test design

试验分组 Grouping		免 疫 Immunization		攻 毒 Challenge		
序号 NO.	名称 Name	数量 Quantity	免疫剂量 (每头) IMD (per head)	免疫日龄 Immune day age	攻毒时间 time	攻毒剂量 dose
3	活+3倍灭活抗原 Live vaccine +3 times inactivated antigen	11	首免: 活疫苗1ml(含 $10^{6.5}TCID_{50}$) 二免: 灭活苗2ml (3倍灭活抗原) First immunity: 1ml live vaccine ($10^{6.5}TCID_{50}$) Second immunity: 2ml inactivated vaccine (3 times inactivated antigen)	首免: 5周龄仔猪 First immunity: 5-week-old piglet		
4	活+佑蓝宝组 Live vaccine+You LanBao	11	首免: 活疫苗1ml(含 $10^{6.5}TCID_{50}$) 二免: 灭活苗2ml (佑蓝宝) First immunity: 1ml live vaccine (at least $10^{6.5}TCID_{50}$) Second immunity: 2ml inactivated vaccine(You LanBao)	二免: 首免后3周 Second immunity: 3 weeks after first immunity	二免后28天 28 days after second immunity	Same as above
5	活+3倍佑蓝宝组 Live vaccine+3 times You LanBao	11	首免: 活疫苗1ml(含 $10^{6.5}TCID_{50}$) 二免: 灭活苗2ml (3倍佑蓝宝) First immunity: 1ml live vaccine (at least $10^{6.5}TCID_{50}$) Second immunity: 2ml inactivated vaccine(3 times You LanBao)			
	对照组 Control group	12	首免: 生理盐水2ml 二免: 生理盐水2ml First immunity: 2ml normal saline Second immunity: 2ml normal saline			

1.2 试验结果 Test result

分 组 Grouping	发病数 Morbidity number	死亡数 Death number	保护数 Protection number
试验1组 Group 1	10/11	8/11	1/11
试验2组 Group 2	11/11	7/11	0/11
试验3组 Group 3	1/11	0/11	10/11
试验4组 Group 4	0/11	0/11	11/11
试验5组 Group 5	0/11	0/11	11/11
对照组	12/12	7/12	0/12

- 试验1组（转移因子+灭活组）和试验2组（灭活+灭活组）攻毒不保护；

There was no protection in group 1(Transfer factor+3 times inactivated antigen)and group 2(3 times activated antigen +3 times inactivated antigen).

- 试验3组（活+3倍灭活苗组）、试验4组（活+佑蓝宝）和试验5组（活+3倍佑蓝宝组）可对强毒攻击保护，说明单独免疫灭活疫苗不能抵抗强毒的攻击, 试验3组（未添加佐剂）保护率为91%（10/11）能够很好地抵抗强毒的攻击，试验4、5组保护率为100%（11/11）是目前预防本病最理想的选择。
- There were protection against the challenge in group 3 (Live vaccine +3 times inactivated antigen) ,group 4(Live vaccine+You LanBao) and group 5 (Live vaccine+3 times You LanBao).It indicates the inactivated vaccine alone could not resist the virulent challenge. The protection rate in group 3 without adjuvant was 91%(10/11).It can resist the highly virulent challenge. The protection rate in group 4 and 5 was 100%(11/11) and is the best choice for preventing and controlling.

PRRS灭活疫苗（佑蓝宝）免疫攻毒试验（2）

PRRS inactivated vaccine(You LanBao) immune challenge test(2)

试验目的:

Test purpose:

不同剂量佑蓝宝的免疫比较试验，以及单独使用活疫苗的保护效果。

Immune test comparison of different doses of You LanBao as well as the protective effect of live vaccine(LV) alone.

2.1 材料与方法 Materials and methods

2.1.1、疫苗 Vaccine

2.1.1.1 **活疫苗**: PRRS (经典+高致) 嵌合病毒活疫苗 (批号: 研20170903), 由杭州佑本研究所制备, 病毒含量 $10^{5.5}$ TCID₅₀/头份;

Live vaccine: PRRS (classic +high pathogenic) chimeric virus live vaccine, batch NO. R&D 20170903, was prepared by Hangzhou Uben institute. The virus content was $10^{5.5}$ TCID₅₀ per head.

2.1.1.2 **灭活疫苗**: 1 μ g/头份、3 μ g/头份, 由杭州佑本动物疫苗有限公司制备, 含Uplus佐剂, Uplus佐剂的添加量为1ml/100头份疫苗。

Inactivated vaccine: 1 μ g inactivated antigen per head and 3 μ g inactivated antigen per head with Uplus adjuvant were prepared by Hangzhou Uben institute. Uplus adjuvant was added in an amount of 1ml per 100 heads vaccine.

2.1.1.3 **0.5 μ g苗**: PRRS灭活疫苗(JXA1株) (批号: 170707)

0.5 μ g vaccine: PRRS inactivated vaccine (JXA1 strain) (Batch NO.: 170707)

2.1 材料与方法 Materials and methods

2.1.2、实验动物 Experimental animals

5周龄PRRS抗原抗体双阴性、PRV gE抗体阴性、PCV2抗原阴性、PEDV抗原阴性的健康仔猪。由武汉亚博特动物健康管理有限公司检测。

5 weeks old piglets with PRRS antigen and antibody double negative, PRV gE antibody negative, PCV2 antigen negative and PEDV antigen negative were tested by Wuhan Yabot Animal Health Management Co.,Ltd.

2.1.3、攻击毒 Challenge virus

PRRSV (NVDC-JXA1株)，第4代，病毒含量为 $10^{6.4}$ TCID₅₀/ml(实际用量 $10^{5.4}$ TCID₅₀/ml)，购自中国兽医药品监察所。

The fourth generation PRRSV (NVDC-JXA1 strain) was purchased by IVDC with a content of $10^{6.4}$ TCID₅₀/ml. The actual dosage was $10^{5.4}$ TCID₅₀/ml.

2.2 试验设计 Test design

试验分组 Grouping			免疫 Immunization		攻毒 Challenge	
序号 NO.	名称 Name	数量 Quantity	免疫剂量 IMD (per head)	免疫日龄 Immune day age	攻毒时间 time	攻毒剂量 dose
1	活疫苗+佑蓝宝 LV+You LanBao	10	首免：活疫苗1头份(含105.5TCID ₅₀) 二免：佑蓝宝 First immunity: one dose of live vaccine (10 ^{5.5} TCID ₅₀) Second immunity: You LanBao	首免：5周龄仔猪 二免：首免后3周 First immunity: 5-week-old piglet Second immunity: 3 weeks after first immunity	二免后4周 4 weeks after second immunity	
2	活疫苗+1/3佑蓝宝 LV+1/3You LanBao	5	首免：活疫苗1头份(含105.5TCID ₅₀) 二免：1/3佑蓝宝 First immunity: one dose of live vaccine (10 ^{5.5} TCID ₅₀) Second immunity: 1/3 You LanBao	首免：5周龄仔猪 二免：首免后3周 First immunity: 5-week-old piglet Second immunity: 3 weeks after first immunity	二免后4周 4 weeks after second immunity	105.4TCID ₅₀ /1ml (国标 105.0TCID ₅₀ /1ml) 2.5倍
3	活疫苗+1/6佑蓝宝 LV+1/6You LanBao	5	首免：活疫苗1头份(含105.5TCID ₅₀) 二免：1/6佑蓝宝 First immunity: one dose of live vaccine (10 ^{5.5} TCID ₅₀) Second immunity: 1/6 You LanBao	首免：5周龄仔猪 二免：首免后3周 First immunity: 5-week-old piglet Second immunity: 3 weeks after first immunity	二免后4周 4 weeks after second immunity	2.5 times than international standard Note: national standard was 10 ^{5.0} TCID ₅₀ /1ml.
4	活疫苗 LV	10	1头份(含105.5TCID ₅₀) one dose of live vaccine (10 ^{5.5} TCID ₅₀)	首免：5周龄仔猪 First immunity: 5-week-old piglet	二免后4周 4 weeks after second immunity	
5	对照组 Control group	5	生理盐水同步处理 synchronous with the immune group	—	与免疫组同步 synchronous with the immune group	

2.3 监测指标 Monitoring indicators

2.3.1 抗体与细胞免疫检测

Antibody and cellular immunoassay

2.3.2 病毒载量监测：送杭州贝尔塔兽医诊断实验室测定。

Viral load monitoring : detect in the Hangzhou Beta Veterinary Diagnostic Laboratory .

2.3.3 增重检测：主要比较攻毒后增重情况。

Weight gain detection: mainly compare the weight gain after challenge.

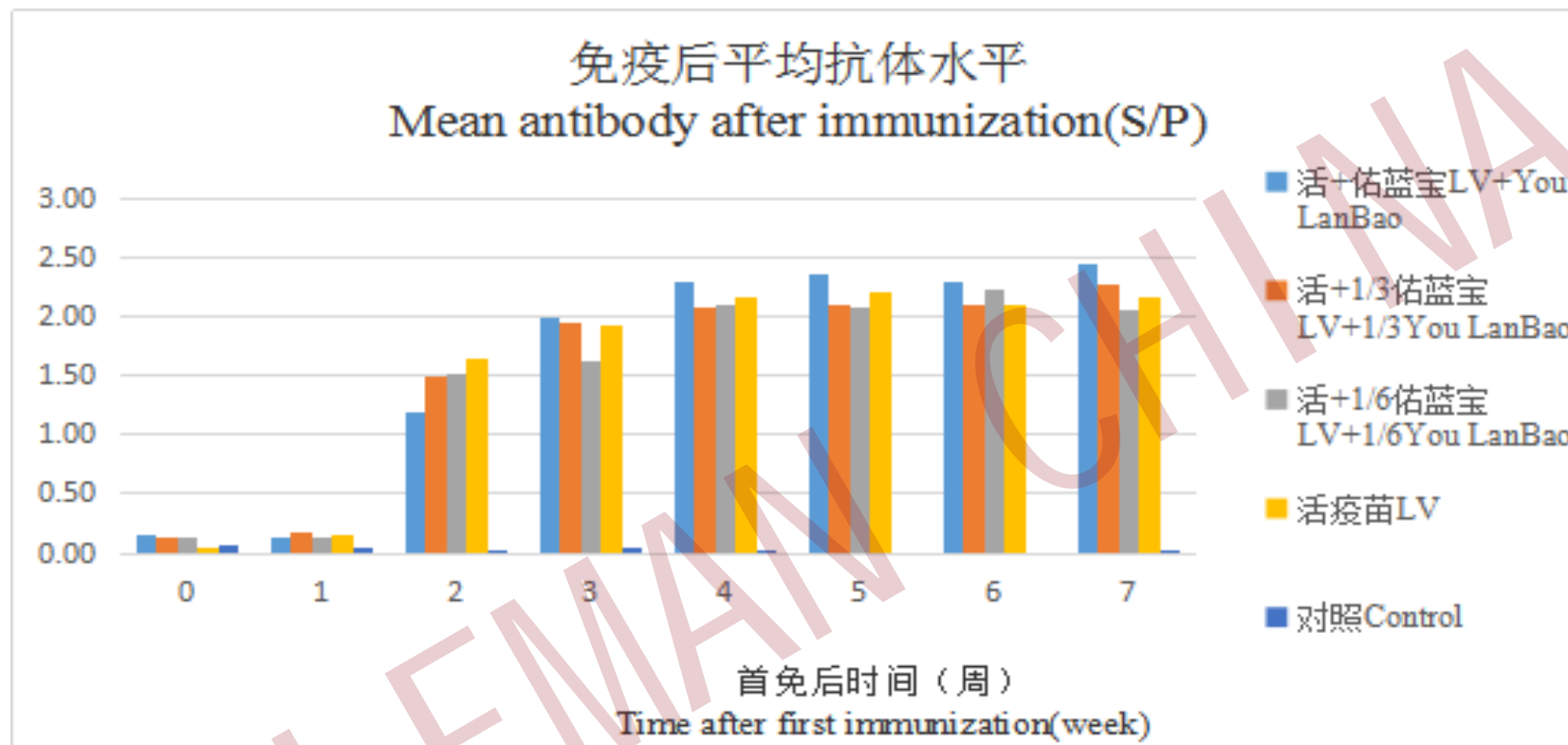
2.3.4 临床症状：根据体温、精神食欲和呼吸症状判定。

Clinical symptoms: determined according to body temperature, appetite and respiratory symptoms.

2.3.5 病理变化：观察是否有肺部实变。

Pathological change: Observe whether there is lung consolidation.

2.4 试验结果-抗体 Test result- antibody

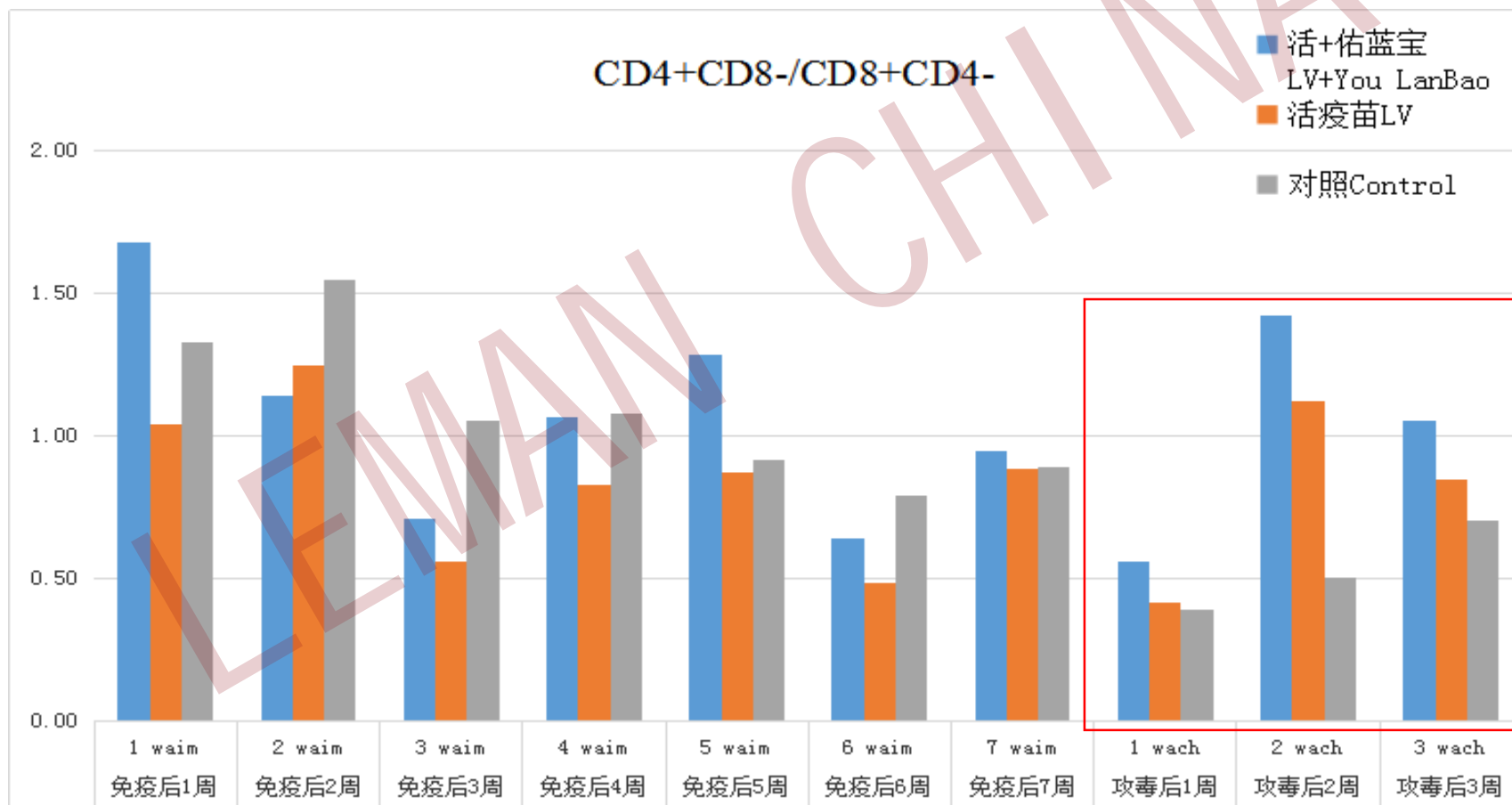


首免后第2周各免疫组平均抗体均转阳，且持续升高，试验1组抗体水平从首免后第3周均高于其他免疫组，S/P平均值在第7周高达2.45。

In the second week after the first immunization, the average antibody of each immunization group turned positive and continued increasing. The antibody level in the group 1 was higher than that of the other immunized groups from the third week after the first immunization and the average S/P level was as high as 2.45 at the 7th week.

2.4 试验结果-细胞免疫 Test results-cellular immunity

免疫及攻毒后不同时间CD4+CD8-/CD8+CD4-值
CD4+CD8-/CD8+CD4-value at different times after immunization and challenge



2.4 试验结果-细胞免疫 Test results-cellular immunity

小结: Summary:

(1) 免疫前期, CD4+CD8-/CD8+CD4-呈逐渐下降趋势, 但整体来说, 试验1中活+佑蓝宝组高于试验4活疫苗组, 直到免疫后第7周两组的数据基本接近。

In the earlier stage, CD4+CD8-/CD8+CD4- showed a gradual decline, but overall the live vaccine +You LanBao in group 1 was higher than the live vaccine in group 4.

(2) 攻毒后第一周各试验组CD4+CD8-/CD8+CD4-值均下降, 第二周免疫组比值迅速升高, 但试验1活+佑蓝宝高于试验4活疫苗组。

The CD4+CD8-/CD8+CD4-values of the experimental groups decreased in the first week after the challenge(wach) and the ratio of the immune group in the second week increased rapidly, but live vaccine+You LanBao in group 1 was higher than live vaccine in group 4.

(3) CD4+T细胞可辅助细胞免疫和体液免疫, 能促进效应细胞抗感染作用; CD4+CD8-/CD8+CD4-比值低表示免疫后的免疫力低, 或者攻毒后的免疫抑制。

CD4+T cells can help cellular and humoral immunity and promote the anti-infective effect of effector cells. Low CD4+CD8-/CD8+CD4- ratio means low immunity after immunization or immunosuppression after challenge.

(4) 因此, 试验1活+佑蓝宝组免疫效果优于试验4活疫苗组。

There, the immune effect of the live vaccine +You LanBao in group 1 was better than the live vaccine in group 4.

2.4 试验结果-病毒载量 Test results-viral load

组别 Grouping	猪号 Pig number		攻毒后第1周 The first week after challenge		攻毒后第2周 The second week after challenge		攻毒后第3周 The third week after challenge		攻毒后第6周 The sixth week after challenge	
	序号 Serial NO.	耳号 Ear NO.	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement
第1组 Group 1 (活+佑蓝宝) (live vaccine+Yoban)	1	462	—	-	—	-	—	-	—	-
	2	477	2.70E+05	+	—	-	7.20E+02	+	—	-
	3	486	—	-	2.10E+02	+	—	-	—	-
	4	1055	5.30E+03	+	1.60E+02	±	—	-	—	-
	5	1769	—	-	4.20E+02	+	2.60E+01	+	1.8E+01	-
	6	1800	—	-	—	-	—	-	/	/
	7	455	—	-	—	-	—	-	—	-
	8	475	—	-	2.20E+01	±	—	-	—	-
	9	482	—	-	—	-	—	-	—	-
	10	491	—	-	4.00E+02	+	—	-	—	-

备注：+表示蓝耳病毒阳性；-表示蓝耳病毒阴性；±表示蓝耳病毒阳性可疑；/表示猪只死亡或迫杀，未检测。

Notes: “+” indicates PRRSV positive. “-” indicates PRRSV negative. “±” indicates PRRSV positive suspicious. “/” indicates pig death or forced death without detection.

2.4 试验结果-病毒载量 Test results-viral load

组别 Grouping	猪号 Pig number		攻毒后第1周 The first week after challenge		攻毒后第2周 The second week after challenge		攻毒后第3周 The third week after challenge		攻毒后第6周 The sixth week after challenge	
	序号 Serial NO.	耳号 Ear NO.	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement
第2组 Group2 (活+1/3佑蓝宝) (live vaccine+1/3You LanBao)	1	492	2.00E+03	+	1.10E+02	±	—	-	—	-
	2	496	7.30E+01	±	—	-	<10	±	—	-
	3	1776	7.60E+02	+	—	-	—	-	/	/
	4	1783	2.20E+02	±	—	-	1.00E+01	±	—	-
	5	1786	2.60E+02	±	—	-	—	-	—	-
第3组 Group3 (活+1/6佑蓝宝) (live vaccine+1/6You LanBao)	1	428	—	-	—	-	—	-	—	-
	2	464	2.10E+02	±	4.30E+03	+	—	-	—	-
	3	465	2.90E+01	±	1.30E+01	±	—	-	—	-
	4	1064	—	-	—	-	—	-	—	-
	5	1796	3.70E+03	+	—	-	1.00E+01	±	/	/

备注: +表示蓝耳病毒阳性; -表示蓝耳病毒阴性; ±表示蓝耳病毒阳性可疑; /表示猪只死亡或迫杀, 未检测。

Notes: “+” indicates PRRSV positive. “-” indicates PRRSV negative. “±” indicates PRRSV positive suspicious. “/” indicates pig death or forced death without detection.

2.4 试验结果-病毒载量 Test results-viral load

组别 Grouping	猪号 Pig number		攻毒后第1周 The first week after challenge		攻毒后第2周 The second week after challenge		攻毒后第3周 The third week after challenge		攻毒后第6周 The sixth week after challenge	
	序号 Serial NO.	耳号 Ear NO.	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement
第4组 Group4 (活疫苗) (live vaccine)	1	431	6.90E+01	±	3.10E+02	+	—	-	—	-
	2	500	6.70E+01	±	—	-	—	-	—	-
	3	1753	3.20E+03	+	1.50E+01	±	—	-	/	/
	4	1768	7.30E+03	+	7.30E+00	-	<10	±	2.6E+02	+
	5	1792	—	-	1.70E+03	+	—	-	—	-
	6	425	3.80E+01	±	—	-	—	-	/	/
	7	449	—	-	3.40E+02	+	—	-	—	-
	8	479	5.00E+01	±	—	-	—	-	5.9E+01	+
	9	1758	3.00E+01	±	2.30E+02	+	—	-	5.9E+01	+
	10	1793	—	-	—	-	—	-	—	-

备注：+表示蓝耳病毒阳性；-表示蓝耳病毒阴性；±表示蓝耳病毒阳性可疑；/表示猪只死亡或迫杀，未检测。

Notes: “+” indicates PRRSV positive. “-” indicates PRRSV negative. “±” indicates PRRSV positive suspicious. “/” indicates pig death or forced death without detection.

2.4 试验结果-病毒载量 Test results-viral load

组别 Grouping	猪号 Pig number		攻毒后第1周 The first week after challenge		攻毒后第2周 The second week after challenge		攻毒后第3周 The third week after challenge		攻毒后第6周 The sixth week after challenge	
	序号 Serial NO.	耳号 Ear NO.	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement	浓度 (拷贝/uL) Concentration (copy/uL)	判定 judgement
第5组 Group5 对照 control	1	458	1.20E+06	+	1.30E+01	±	<10	±	/	/
	2	487	3.20E+06	+	3.30E+03	+	/	/	/	/
	3	1057	1.10E+08	+	/	/	/	/	/	/
	4	1788	5.40E+05	+	3.30E+05	+	/	/	/	/
	5	1797	9.90E+05	+	1.00E+03	+	1.70E+02	+	/	/

备注：+表示蓝耳病毒阳性；-表示蓝耳病毒阴性；±表示蓝耳病毒阳性可疑；/表示猪只死亡或迫杀，未检测。

Notes: “+” indicates PRRSV positive. “-” indicates PRRSV negative. “±” indicates PRRSV positive suspicious.”/” indicates pig death or forced death without detection.

小结: Summary:

(1) 攻毒后第一周病毒载量结果显示: 试验第1组 (活+佑蓝宝) 阴性检出率为80% (8/10) , 试验第4组 (活疫苗) 阴性检出率30% (3/10) ,二者有明显差异。

The results of viral load in the first week after challenge showed the negative detection rate of the live+You LanBao in group 1 was 80% (8/10) and that of live vaccine in group 4 was 30% (3/10). There was a significant difference between two groups.

(2) 攻毒后各免疫组猪只血清均可检测到病毒, 随着攻毒时间 (1~6周) 的延长病毒载量呈逐渐下降趋势, 6周后检测, 试验1、2、3组全部转阴, 试验4组试验猪仍有30% (3/10) 的阳性。

After the challenge, the virus could be detected in the sera of each immunized group. The virus load gradually decreased with the prolonged challenge time from 1 week to 6 weeks. The test result in the 6th week showed it was negative in group 1,2 and 3 and it was 30% (3/10) positive in group 4.

2.4 试验结果-平均体重 Test results-average weight

攻毒前后猪只的平均体重 (kg)

Average body weight of pigs before and after challenge (kg)

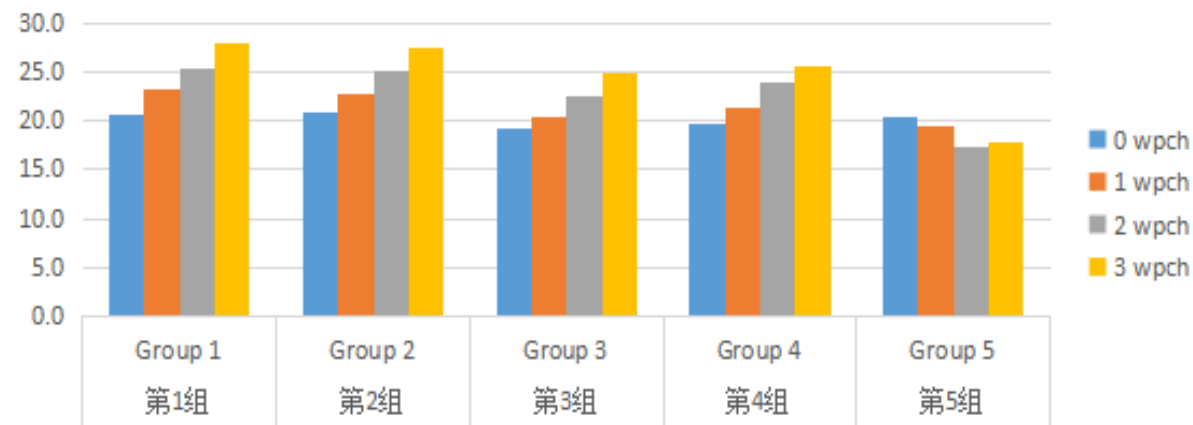
序号 Serial NO.	组别 Grouping	攻毒前 Before challenge	攻毒后1周 One week after challenge	攻毒后2周 two weeks after challenge	攻毒后3周 Three weeks after challenge
1	活+佑蓝宝 LV+You LanBao	20.6±2.9	23.1±3.2	25.3±3.3 (**)	28.0±3.4 (**)
2	活+1/3佑蓝宝 LV+1/3You LanBao	20.9±1.6	22.7±2.0	25.1±2.5 (*)	27.6±2.9 (**)
3	活+1/6佑蓝宝 LV+1/6You LanBao	19.3±4.0	20.3±4.7	22.5±5.2	25.0±6.0 (*)
4	活疫苗 LV	19.6±3.8	21.4±4.3	23.9±4.0 (*)	25.5±4.3 (**)
5	对照 Control	20.5±3.3	19.4±3.5	17.4±2.7	17.8±3.3

注: *表示与对照组差异显著($P \leq 0.05$),
**表示与对照组差异极显著($p \leq 0.01$)。

Note: * indicates significant difference from the control group ($P \leq 0.05$), ** indicates that the difference from the control group is extremely significant ($p \leq 0.01$).

攻毒后各组仔猪的平均增重 (kg)

Average weight gain of piglets in each group post challenge (kg)



2.4 试验结果-平均增重 Test results-average weight gain

各试验组攻毒后不同时间段较攻毒前的增重情况（平均值，单位：kg）

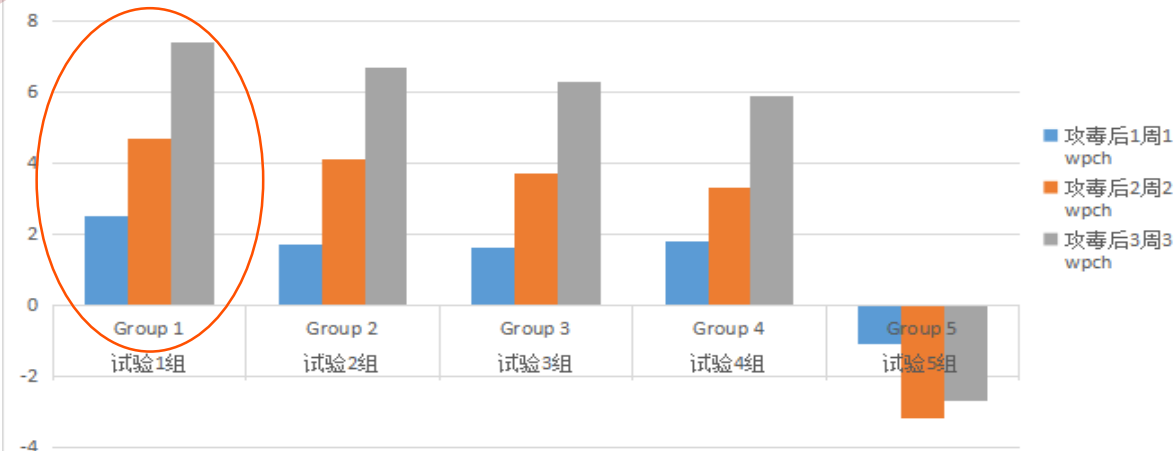
The weight gain of each test group at different time after challenge(average, unit :kg)

序号 Serial NO.	组别 Grouping	攻毒后1周 One week after challenge	攻毒后2周 two weeks after challenge	攻毒后3周 Three weeks after challenge
1	活+佑蓝宝 LV+You LanBao	2.5±1.1 (5**)	4.7±1.3 (5**, 4**)	7.4±1.3 (5**, 4*)
2	活+1/3佑蓝宝 LV+1/3You LanBao	1.7±0.8 (5*)	4.1±1.0 (5**)	6.7±1.4 (5**)
3	活+1/6佑蓝宝 LV+1/6You LanBao	1.6±0.5 (5*)	3.7±1.0 (5**)	6.3±1.8 (5**)
4	活疫苗 LV	1.8±0.9 (5*)	3.3±0.6 (5**)	5.9±1.1 (5**)
5	对照组 Contrpl	-1.1±1.8	-3.2±2.6	-2.7±2.9

注：*表示与对照组差异显著($P \leq 0.05$), **表示与对照组差异极显著($p \leq 0.01$)；5表示与对照组比较；4表示与活疫苗组比较。

Note: * indicates significant difference from the control group ($P \leq 0.05$), ** indicates that the difference from the control group is extremely significant ($p \leq 0.01$); "5" indicates comparison with the control group; "4" indicates comparison with the live vaccine group.

攻毒后不同时间相对攻毒前的增重 (kg)
Weight gain at different times compared to before challenge (kg)



2.4 试验结果-平均增重 Test results-average weight gain

- (1) 攻毒后对照组猪只体重于攻毒前期减轻，攻毒后期存活猪只体重略有增加。
After the challenge, the weight of the pigs in the control group was reduced in the early stage. The weight of the pigs in the late stage of the challenge was slightly increased.
- (2) 试验1组、试验2组、试验3组和试验4组猪只增重明显。
The weight gain of pigs in group 1,2,3,and 4 was obvious.
- (3) 其中试验1活+佑蓝宝组增重 ($7.4\pm 1.3\text{kg}$) 最多，且比试验 4活疫苗组(增重 $5.9\pm 1.1\text{kg}$) 多增重。
Among them, LV+ You LanBao in group 1 gained the most weight ($7.4\pm 1.3\text{kg}$) and the weight gain in group 1 was **1.5kg** more than LV group in group 4 (weight gain $5.9\pm 1.1\text{kg}$).

2.4 试验结果-临床症状 Test results-clinical symptoms

免疫攻毒后临床症状、剖检变化及保护率统计表

Clinical symptoms, necropsy changes and protection rate statistics after challenge

组别 Group	猪号 Pig NO.	3日体温41°C以上 3 days, body temperature above 41 °C	临床症状 Clinical symptoms	死亡 Death	肺脏实变 Lung consolidation	发病 Morbidity	死亡 Death number	判定(保护) Judgement (protection)
活+佑蓝宝 LV+You LanBao	1	+	正常 normal	-	N			
	2	+	正常 normal	-	N			
	3	-	正常 normal	-	N			
	4	-	正常 normal	-	N			
	5	+	正常 normal	-	N			
	6	-	正常 normal	-	-	0/10	0/10	10/10
	7	+	正常 normal	-	N			
	8	-	正常 normal	-	N			
	9	-	正常 normal	-	N			
	10	-	正常 normal	-	N			
活+1/3佑蓝宝 LV+1/3You LanBao	1	+	正常 normal	-	N			
	2	-	正常 normal	-	N			
	3	+	正常 normal	-	-	0/5	0/5	5/5
	4	+	正常 normal	-	N			
	5	-	正常 normal	-	N			

注: “-”代表阴性; “+”代表阳性; N代表临床健康存活猪, 未剖检, 继续进行病毒载量试验。

Notes: “-” stands for negative; “+” stands for positive; N stands for clinically healthy and surviving pigs, without necropsy, and continues the viral load test.

2.4 试验结果-临床症状 Test results-clinical symptoms

免疫攻毒后临床症状、剖检变化及保护率统计表
Clinical symptoms, necropsy changes and protection rate statistics after challenge

组别 Group	猪号 Pig NO.	3日体温41℃以上 3 days, body temperature above 41 °C	临床症状 Clinical symptoms	死亡 Death	肺脏实变 Lung consolidation	发病 Morbidity	死亡 Death number	判定(保护) Judgement (protection)
活+1/6佑蓝 宝 LV+1/6You LanBao	1	-	正常normal	-	N			
	2	+	正常normal	-	N			
	3	-	正常normal	-	N	0/5	0/5	5/5
	4	-	正常normal	-	N			
	5	-	正常normal	-	N			
活疫苗 LV	1	+	正常normal	-	N			
	2	-	正常normal	-	N			
	3	-	正常normal	-	N			
	4	-	正常normal	-	N			
	5	-	正常normal	-	N			
	6	-	正常normal	-	+	0/10	0/10	10/10
	7	+	正常normal	-	N			
	8	+	正常normal	-	N			
	9	-	正常normal	-	N			
	10	+	正常normal	-	N			

注：“-”代表阴性；“+”代表阳性；N代表临床健康存活猪，未剖检，继续进行病毒载量试验。

Note: "-" stands for negative; "+" stands for positive; N stands for clinically healthy and surviving pigs, without necropsy, and continues the viral load test.

2.4 试验结果-临床症状 Test results-clinical symptoms

免疫攻毒后临床症状、剖检变化及保护率统计表
Clinical symptoms, necropsy changes and protection rate statistics after challenge

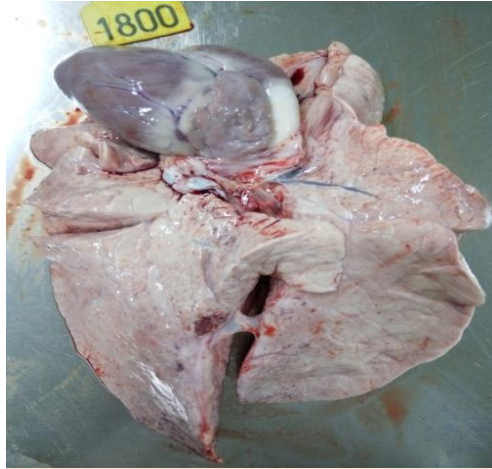
组别 Group	猪号 Pig NO.	3日体温41°C以上 3 days, body temperature above 41 °C	临床症状 Clinical symptoms	死亡 Death	肺脏实变 Lung consolidation	发病 Morbidity	死亡 Death number	判定(保护) Judgement (protection)
对照组 Control	1	+		-	+			
	2	+	精神沉郁、厌食、咳嗽、喘	+	+			
	3	+	Mental depression, anorexia, cough, asthma	-	+	5/5	3/5	0/5
	4	+		+	+			
	5	+		+	+			

注：“-”代表阴性；“+”代表阳性；N代表临床健康存活猪，未剖检，继续进行病毒载量试验。

Note: "-" stands for negative; "+" stands for positive; N stands for clinically healthy and surviving pigs, without necropsy, and continues the viral load test.

2.4 试验结果-病理剖检 (免疫组)

Test results-clinical symptoms(immune group)



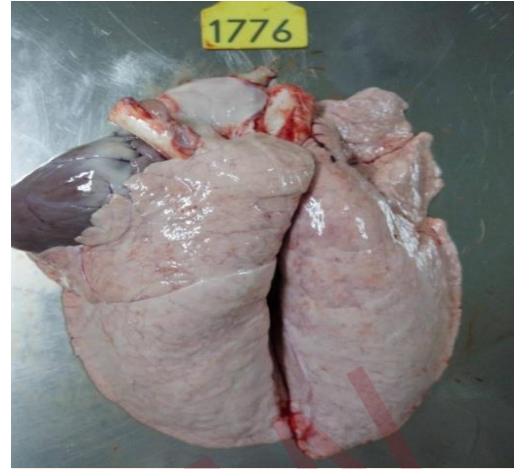
试验1组:

活+佑蓝宝组

The group 1(Live vaccine+ You LanBao):

免疫猪攻毒后21天肺脏病理剖检变化 (迫杀)

The lung pathological examination changes in the forced kill pigs 21 days after challenge



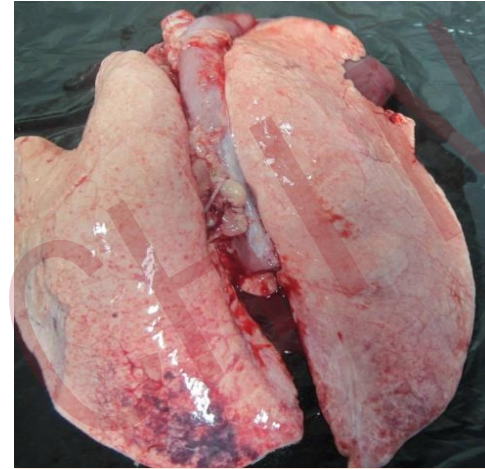
试验2组:

活+ 1/3佑蓝宝组

The group 2(Live vaccine+ 1/3You LanBao):

免疫猪攻毒后21天肺脏病理剖检变化 (迫杀)

The lung pathological examination changes in the forced kill pigs 21 days after challenge



试验3组:

活+ 1/6佑蓝宝组

The group 3(Live vaccine+ 1/6You LanBao):

免疫猪攻毒后21天肺脏病理剖检变化

(迫杀, 耳标被咬掉)

The lung pathological examination changes in the forced kill pigs 21 days after challenge

Note: Ear tag is bitten off



试验4组:

活疫苗

The group 4(Live vaccine):

免疫猪攻毒后21天肺脏病理剖检变化 (迫杀)

The lung pathological examination changes in the forced kill pigs 21 days after challenge

2.4 试验结果-病理剖检 (对照组)

Test results-pathological examination (Control group)



试验5组:

对照组猪攻毒后21天肺脏

病理剖检变化

The group 5(control group):
The lung pathological
examination changes in the pigs
21 days after challenge .

2.5 本试验结论 Conclusion in the test

- 2.5.1 抗体水平：试验1组高于其他免疫组，S/P平均值高达2.45；
Antibody level: It was higher in the group 1 than the other immune groups and the S/P average was as high as 2.45.
- 2.5.2 细胞免疫：试验1组细胞免疫水平优于试验4组；
Cellular immunity: The level of cellular immunity in group 1 was better than that in the group 4.
- 2.5.3 血清病毒载量：攻毒后第1周试验1组阳性率最低，为20%；
Serum viral load: It had the lowest positive rate of 20% in the group 1.
- 2.5.4 攻毒保护：试验1组100%保护。
Challenge protection: there was 100% protection in group 1.
- 2.5.5 增重情况：试验1组（增重 $7.4 \pm 1.3\text{kg}$ ）比试验4组（增重 $5.9 \pm 1.1\text{kg}$ ）多增重1.5kg。
Weight gain: The weight gain was $7.4 \pm 1.3\text{kg}$ in group 1 and $5.9 \pm 1.1\text{kg}$ in group 4. The group 1 is 1.5kg more than group 4.

本研究结果证明试验1组免疫效果最好。

The results of the study demonstrated that group 1 had the best immune effect.



内容提要 Abstract



PRRS防控的挑战

The significance of PRRS prevention and control



PRRS灭活疫苗免疫攻毒试验

Immune challenge test with PRRS inactivated vaccine



PRRS灭活疫苗田间试验

Field trial of PRRS inactivated vaccine



结论

Conclusion



PRRS灭活疫苗的田间防控试验

Field control experiment of PRRS inactivated vaccine

目的： Purpose：

为了更加完整的评估佑蓝宝在实际生产中的免疫保护效果，我们在某集团展开了一系列针对母猪流产及保育仔猪的免疫试验。

To more fully evaluate the immune protection effect of You LanBao in actual protection, We launched a series of immunoassays for sow abortion and nursery piglets in a group.

佑蓝宝田间试验-母猪防控

You LanBao field trial for sow prevention and control

- **猪场背景:** Background of pig farm:

某集团集约化母猪场，存栏母猪6300头，妊娠后期表现（12周后）流产。为了解决流产问题，进行了PRRS相关疫苗免疫试验。

A group intensive sow farm with 6300 sows in stock showed abortion in late pregnancy of 12 weeks later. In order to solve the problem of abortion, a PRRS-related vaccine immunization test was conducted.

佑蓝宝田间试验-母猪防控

You LanBao field trial for sow prevention and control

- **PRRS疫苗田间免疫试验：** PRRS vaccine field trial:

第一次活疫苗免疫： 6300头母猪进行普免，应用某进口PRRSV VR-2332株经典弱毒疫苗，肌注1头份/头（3月13日），免疫后观察23天（4月5日），与以往同群同种疫苗免疫相比日均流产数有所上升（免疫前0.75头/日（9头/12天），免疫后0.83头/日（19头/23天）

The first live vaccine immunization: The 6300 sows were given universal immunization with a classic imported attenuated vaccine of PRRSV VR-2332 strain ,with intramuscular injection of 1 head dose per head on March 13th .Observe for 23 days after immunization on April 5th and the daily average abortion rate increased compared with the same group of the same vaccine immunization from 0.75 heads/day 9 heads/12 days before immunization to 0.83 heads/day 19 heads / 23 days after immunization (figure 3).

佑蓝宝田间试验-母猪防控

You LanBao field trial for sow prevention and control

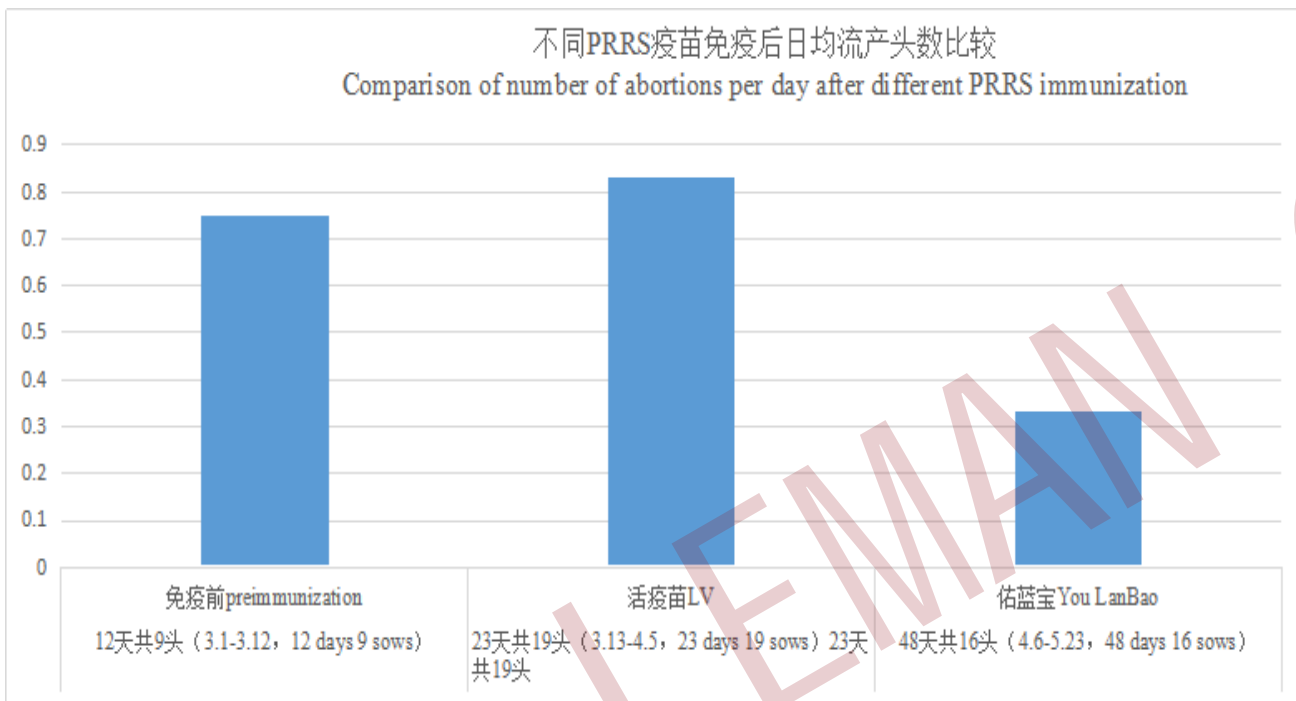
- **PRRS疫苗田间免疫试验:** PRRS vaccine field trial:

第二次灭活疫苗免疫: 为了解决第一次免疫后流产率上升问题, 对6300头母猪又进行了普免, 肌注佑蓝宝1ml/头, 免疫后观察48天(至5月23日), 日均流产数0.33头/日(16头/48天), 下降明显。

The second inactivated vaccine immunization: In order to solve the problem of increased abortion rate after the first immunization, 6300 sows were given a general immunization with You LanBao 1ml per head with intramuscular injection. Observe for 48 days after immunization on May 23th and the average daily abortion number was decreased significantly to 0.33 heads/day 16 heads/48 days .

佑蓝宝对妊娠后期流产的保护对比试验

Comparison of You LanBao's protection against abortion in late pregnancy



YC 猪场佑蓝宝使用效果跟踪

Application effect tracking of You LanBao in YC pig farm

日期 Date	疫苗 Vaccine category	流产数 Abortion numbers
3.13	某进口活疫苗 Imported LV	
4.5	佑蓝宝 You LanBao	
3.1-3.12		9
3.13-3.31		15
4.1-4.5		4
4.6-4.30		10
5.1-5.23		6

PRRSV抗原 (荧光定量RT-PCR) -种猪

PRRSV antigen (real-time quantitative RT-PCR) - Breeding pigs

分类 category	免疫后时间 Time after immunization (week)					
	0	2	4	6	8	10
血清 serum	/	/	/	—	—	—
	/	/	/	—	—	—
	/	/	/	—	—	—
	/	/	/	—	—	—
	/	/	/	—	—	—
脐带血 cord blood	—	—	—	—	—	—
	—	—	—	—	—	—
	—	—	—	—	—	—
	—	—	—	—	—	—
	—	—	—	—	—	—
	—	—	—	—	—	—
	—	—	—	—	—	—
	—	—	—	—	—	—

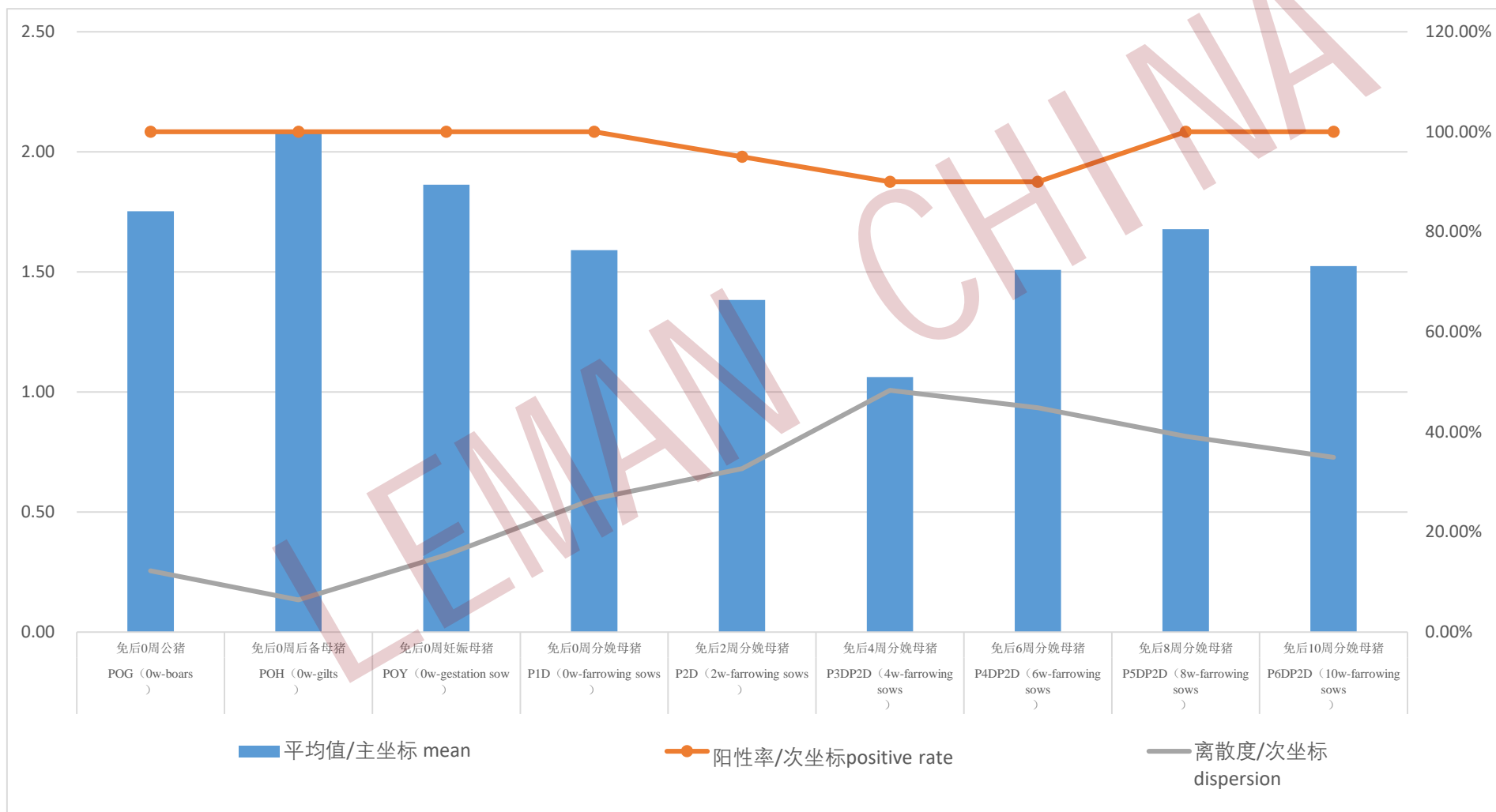
PRRSV抗体(静脉血)-种猪

PRRSV antibody (venous blood) - Breeding pigs

	POG	POH	POY	P1D	P2D	P3D	P4D	P5D	P6D
分类 category	免疫当天公猪 0 week after immunization-boars	免疫当天后备母猪 0 week after immunization-gilts	免疫当天妊娠母猪 0 week after immunization-gestation sow	免疫当天分娩母猪 0 week after immunization-farrowing sows	免疫后2周分娩母猪 2 weeks after immunization-farrowing sows	免疫后4周分娩母猪 4 weeks after immunization-farrowing sows	免疫后6周分娩母猪 6 weeks after immunization-farrowing sows	免疫后8周分娩母猪 8 weeks after immunization-farrowing sows	免疫后10周分娩母猪 10 weeks after immunization-farrowing sows
平均值 mean	1.75	2.09	1.86	1.59	1.38	1.06	1.51	1.68	1.52
阳性率 positive rate	100.00%	100.00%	100.00%	100.00%	95.00%	90.00%	90.00%	100.00%	100.00%
离散度 dispersion	12.24%	6.45%	15.42%	26.65%	32.64%	48.33%	44.82%	39.11%	34.94%

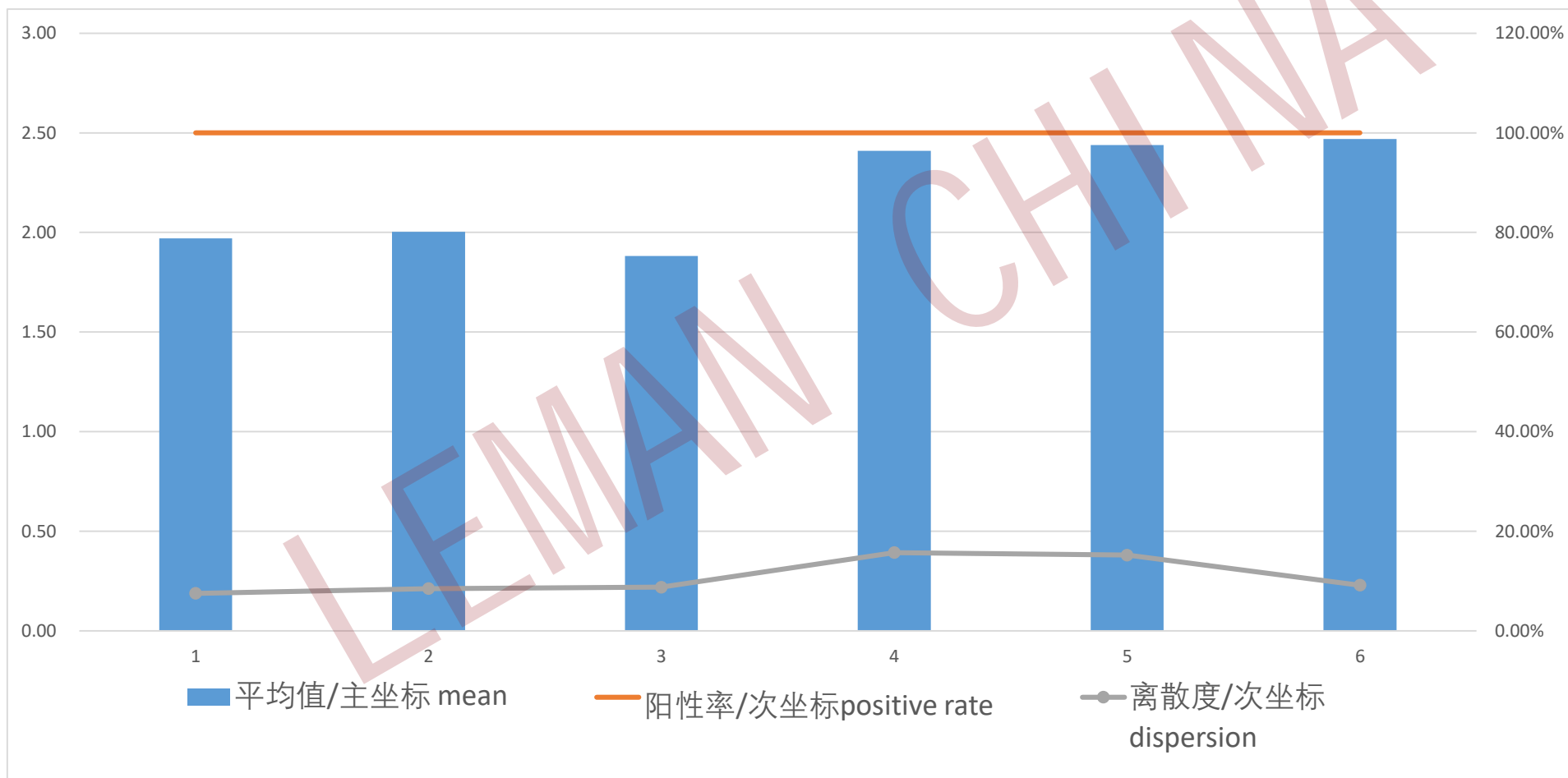
静脉血PRRSV抗体分析

Analysis of PRRSV antibody in porcine venous blood



免疫后不同时间分娩母猪初乳 PRRSV 抗体

PRRSV antibody in colostrum of sows at different time after immunization



佑蓝宝田间试验-保育猪防控1

You LanBao Field Trial - Prevention and Control for nursery pigs (1)

- **猪场背景:** Pig farm background:

某集团保育猪群6-8周龄发病，经实验室诊断为PRRS感染。

The 6-8 weeks old nursery pigs in a group pig farm had been diagnosed with PRRS infection by laboratory.

- 为了观察佑本佑蓝宝+佑圆宝对该集团保育猪的免疫保护效果，设计6个试验组免疫仔猪：

In order to observe the immune protection effect of Uben You LanBao + You YuanBao on the pigs in the group, six test groups were designed to immunize piglets

佑蓝宝田间试验-保育猪防控

You LanBao Field Trial - Prevention and Control for nursery pigs

- **1组: 7天免疫弱毒苗0.5头份+断奶当天免疫佑蓝宝1ml**

Group 1: 7-day-old piglets were immunized attenuated vaccine 0.5 head dosage + 1ml You LanBao on weaning day.

- **3组: 7天免疫弱毒苗0.5头份+28天免疫佑蓝宝1ml**

Group 3 :7-day-old piglets were immunized attenuated vaccine 0.5 head dosage + 1ml You LanBao for 28-day-old piglets .

- **5组: 14天免疫弱毒苗0.5头份+28天免疫佑蓝宝1ml**

Group 5: 14-day-old piglets were immunized attenuated vaccine 0.5 head dosage + 1ml You LanBao for 28-day-old piglets .

- **2组: 14天免疫弱毒苗0.5头份+断奶当天免疫佑蓝宝1ml**

Group 2: 14-day-old piglets were immunized attenuated vaccine 0.5 head dosage + 1ml You LanBao on weaning day .

- **4组: 7天免疫弱毒苗0.5头份+28天免疫佑蓝宝1ml+佑圆宝1ml, 混合后2ml/头普免**

Group 4 :7-day-old piglets were immunized attenuated vaccine 0.5 head dosage + 1ml You LanBao +1ml You YuanBao for 28-day-old piglets after mixing to 2ml .

- **6组: 14天免疫弱毒苗0.5头份+28天免疫佑蓝宝1ml+佑圆宝1ml, 混合后2ml/头普免**

Group 6: 14-day-old piglets were immunized attenuated vaccine 0.5 head dosage + 1ml You LanBao +1ml You YuanBao for 28-day-old piglets after mixing to 2ml .



某集团佑蓝宝对保育期PRRSV感染猪群的防控试验

Prevention and Control Experiment of You LanBao on PRRSV Infected Pigs in nursery Period for a group farm

某集团猪场免疫佑蓝宝后死淘率统计表

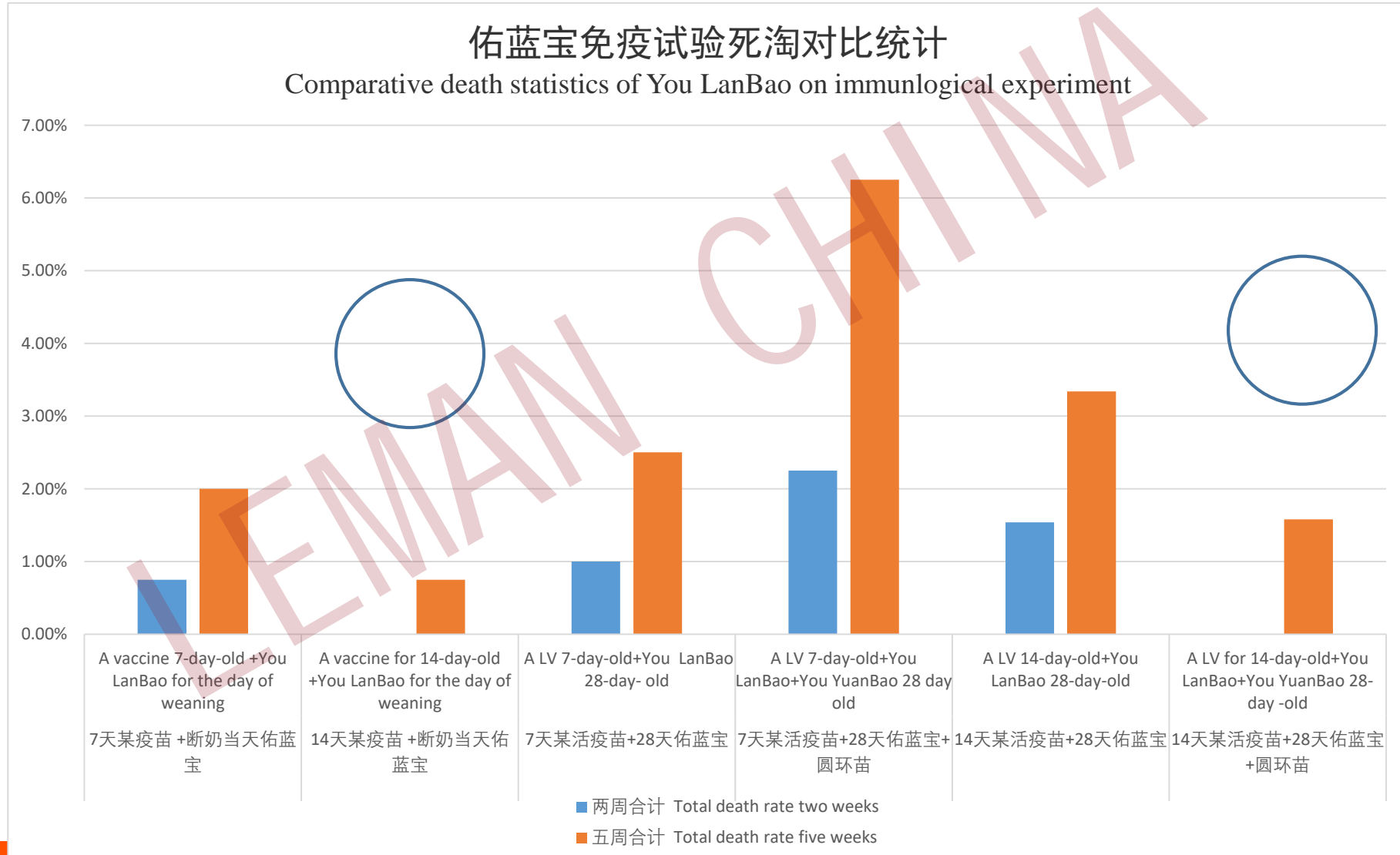
Death rate statistics in a pig farm after immune You LanBao

养殖户 Farmer	免疫方案 Immuization Program	领苗日期 Date	免疫猪数 Immune pigs	两周合计 Total in two weeks	五周合计 Total in five weeks	两周合计死淘率 Total death rate in two weeks	五周合计死淘 Total death rate in five weeks	累计死淘 Cumulative death rate
A	佑本苗+Slan Uben vaccine+Slan	2018/3/10	400	3	8	0.75%	2.00%	2.00%
B	佑本苗+Slan Uben vaccine+Slan	2018/3/10	400	0	3	0.00%	0.75%	1.25%
C	7天sb苗+28天佑蓝宝 sb vaccine for 7-day-old +You LanBao for 28-day-old	2018/3/24	400	4	10	1.00%	2.50%	4.25%
D	7天sb苗+28天佑蓝宝+圆环苗 sb vaccine for 7-day-old +You LanBao+You YuanBao for 28-day-old	2018/3/24	400	9	25	2.25%	6.25%	6.75%
E	14天sb苗+28天佑蓝宝 sb vaccine for 14-day-old +You LanBao for 28-day-old	2018/4/11	389	6	13	1.54%	3.34%	3.60%
F	14天sb苗+28天佑蓝宝+圆环苗 sb vaccine for 14-day-old +You LanBao+You YuanBao for 28-day-old	2018/4/11	443	0	7	0.00%	1.58%	1.58%
		2018/4/14	2432	22	66	0.90%	2.71%	



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佑蓝宝田间不同免疫组合试验-保育猪防控2

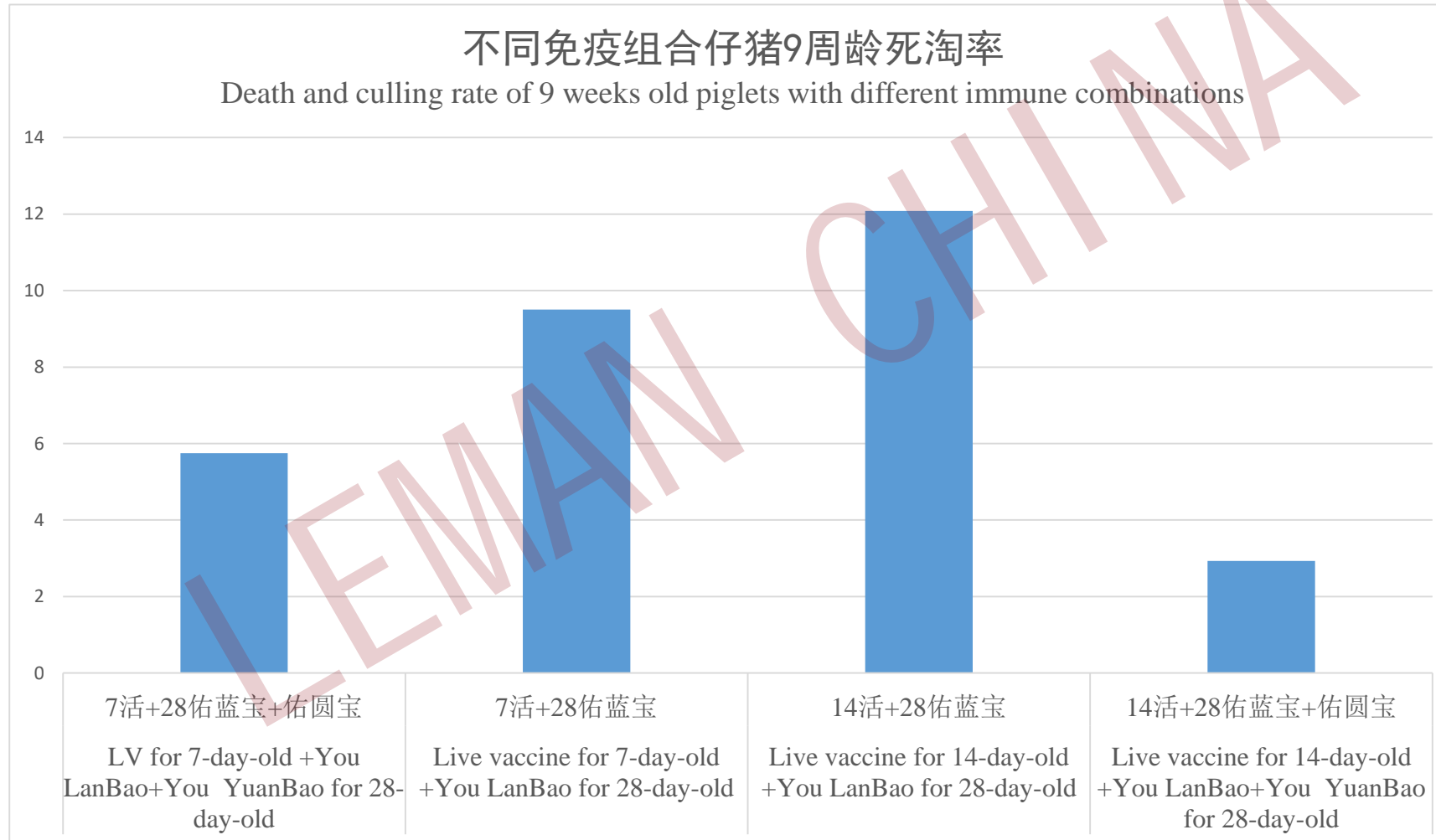
You LanBao Field Trial -Different immune combination tests in field of You LanBao-Prevention and Control for nursery pigs(2)

进苗日期 Date of receiving vaccine	养户 Farmer	均重 Average weight	初始日龄 Starting age	结束日龄 Ending age	免疫头数 Immune Number	死淘数 Death and culling number	死淘率 Death and culling rate	存栏数 Stocking number	免疫程序 Immune procedure
2018/4/22	1	14.54	25	163	400	23	5.75	377	7天活+28佑蓝宝+佑圆宝 Live vaccine for 7-day-old +You LanBao+You YuanBao for 28-day-old
2018/4/22	2	14.47	25	163	400	38	9.50	362	7天活+28佑蓝宝 Live vaccine for 7-day-old +You LanBao for 28-day-old
2018/4/22	3	14.53	25	145	397	48	12.09	242	14天活+28佑蓝宝 Live vaccine for 14-day-old +You LanBao for 28-day-old
2018/4/22	4	15.29	25	142	409	12	2.93	430	14天活+28佑蓝宝+佑圆宝 Live vaccine for 14-day-old +You LanBao+You YuanBao for 28-day-old
小计 Subtotal		14.72	/	/	1632	121	7.41	1511	/



佑蓝宝+佑圆宝仔猪不同免疫组合死淘率比较

Comparison of the death-culling rate of piglets with different immunization combinations of You Lanbao and You Yuanbao



某集团佑蓝宝公猪试验数据

Test data of You LanBao on boar in a group

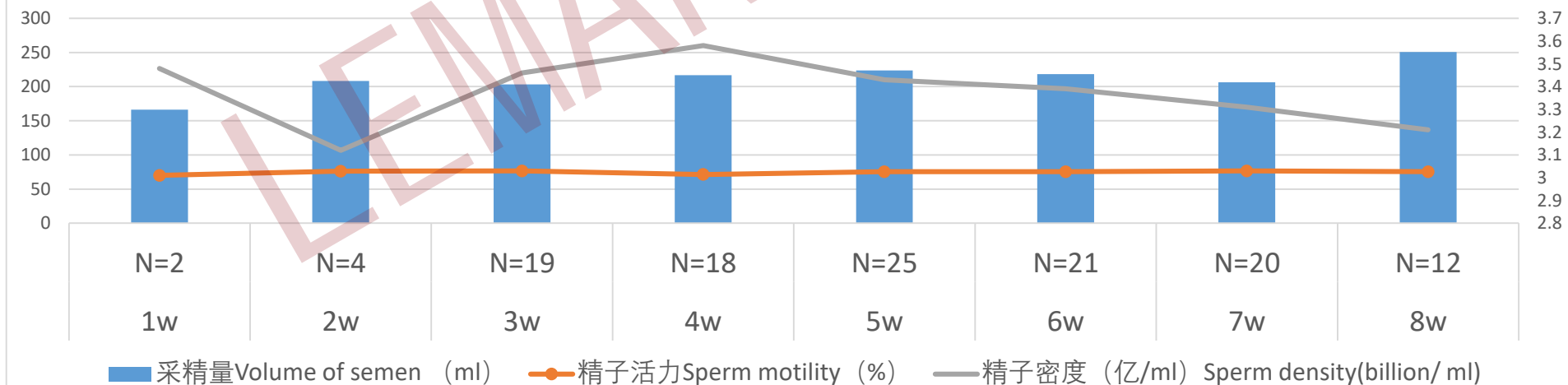
免疫佑蓝宝后不同时间(周)公猪精液品质参数平均值

Average value of boar semen quality parameters at different times (week) after immune with You LanBao

分类 Category	免后第1周 1w	免后第2周 2w	免后第3周 3w	免后第4周 4w	免后第5周 5w	免后第6周 6w	免后第7周 7w	免后第8周 8w
采精次数 Times of collecting semen	N=2	N=4	N=19	N=18	N=25	N=21	N=20	N=12
采精量 Volume of semen (ml)	166.05±22.27	208.25±72.67	203.05±77.59	216.76±64.52	223.49±82.11	218.29±80.76	206.27±68.47	250.61±58.42
精子活力 Sperm motility (%)	70.00±0.00	76.25±4.79	76.58±4.43	71.39±2.87	75.40±3.51	75.48±4.45	76.50±4.01	75.42±3.96
精子密度(亿/ml) Sperm density(billion/ml)	3.48±0.21	3.12±1.21	3.46±0.92	3.58±0.74	3.43±0.80	3.39±0.93	3.31±0.84	3.21±0.60

免疫佑蓝宝后不同时间(周)公猪精液品质变化

Changes in quality of boar semen at different times (w) after immune with You LanBao



目前为止佑蓝宝试验

So far, we have completed the test about You LanBao

- **佑本内部 In UBEN:**

- 完成4轮仔猪攻毒试验;

Four times immune challenge tests on piglets;

- **某集团 In a group:**

- 2轮仔猪攻毒试验, 3轮母猪攻毒试验;

Two times immune challenge tests on piglets and three immune challenge tests on sows

- 13轮田间免疫保护试验;

Thirteen times tests of immunity protection in field

- **其他20个集团 In the other 20 groups:**

- 不同的母猪、仔猪免疫保护试验几十次

Dozens times tests of immune protection on sow or piglets.

结论? Conclusion?

内容提要 Abstract



PRRS防控的挑战

The significance of PRRS prevention and control



PRRS灭活疫苗免疫攻毒试验

Immune challenge test with PRRS inactivated vaccine



PRRS灭活疫苗田间试验

Field trial of PRRS inactivated vaccine



结论

Conclusion



Science-driven solutions™

4.1 实验室免疫攻毒试验结论

Conclusion of laboratory immune challenge test

通过两次免疫攻毒试验，证明：

- 阴性猪群单独使用PRRS灭活苗一次或多次免疫，即使抗原含量很高，也没有表现出有效的免疫保护；

It is proved in two immune challenge test that PRRSV inactivated vaccine alone still has no immune effect on the negative pigs ,whether it is immunized one time or two and no matter how many or how pure the antigen content is.

- 佑蓝宝对活疫苗激活猪群能提供完全保护，并且可以更快地减少试验猪群病毒血症；

You LanBao provides complete protection for herds activated by live vaccines and can reduce herds viremias more quickly.

- 佑蓝宝与弱毒疫苗联合免疫猪群相对单独使用弱毒苗免疫猪群，增重更加明显。

The weight gain in the combination of You LanBao and the attenuated vaccine was more obvious than only use of attenuated vaccine.

4.2 佑蓝宝田间试验结论

Conclusion of You LanBao field trial

4.2.1 母猪佑蓝宝田间试验结论：

The conclusion of Yu LanBao field trial for the sow :

- 单独使用弱毒苗免疫后未能起到保护效果，免疫后妊娠母猪流产有增多趋势；

The use of attenuated vaccine alone did not protect the immune system, and the abortion of pregnant sows increased after immunization;

- 佑蓝宝免疫后母猪流产呈下降趋势，免疫保护确实，日均流产数由0.83%降到佑蓝宝免疫后48天内的0.32%，低于流产警戒线，属于正常范围。

After the immunization of You LanBao, the abortion of sows showed a downward trend. The protection effect was confirmed. The daily average abortion decreased from 0.83% to 0.32% within 48 days after the immunization of You LanBao, which was lower than the abortion warning line and belonged to the normal range.

4.2 佑蓝宝田间试验结论

Conclusion of You LanBao field trial

4.2.2 保育猪佑蓝宝田间试验结论：

Conclusion of You LanBao field trial for nursery pigs:

- 佑蓝宝相对以前生产数据都表现有良好免疫保护；

You LanBao has good immune protection against previous production data;

- 14日龄弱毒苗+28日龄佑蓝宝优于7日龄弱毒苗+28日龄佑蓝宝；

14-day-old attenuated vaccine + 28-day-old You LanBao is better than 7-day-old attenuated vaccine + 28-day-old You LanBao;

- 激活时间相同时，断奶当天（21日龄）免疫佑蓝宝的保护效果优于28天的免疫效果；

When the activation time is the same, the protection effect of the immune You LanBao on 21-day-old weaning day is better than on the 28-day.

- 佑蓝宝与圆环疫苗同时混合后免疫效果与不同阶段分开免疫效果没有明显差异。

There is no significant difference between the immune effect of the combination of You LanBao and the PCV-2 vaccine and the separate immune effects at different stages.

综上所述：

In summary:

◆ **PRRS灭活疫苗只有在以下三种情况下有效：**

PRRS inactivated vaccines are only effective in the following three situations.

- 自然感染PRRSV阳性猪群

The positive pigs were naturally infected by PRRSV.

- PRRSV弱毒活疫苗提前免疫激活猪群（人工感染阳性猪群）

The herd were activated by attenuated live PRRSV vaccines or infected artificially in advance.

- 自家血清驯化猪群

The herd were domesticated by own farm serum.



综上所述：

In summary:

◆ **PRRS灭活疫苗(佑蓝宝)可用于防治PRRSV的各种感染:**

PRRS inactivated vaccine(You LanBao) can be used as prevention and treatment for various infections of PRRSV.

1. 母猪流产; Sow abortion;
2. 保育猪5-9周龄发病; Prevention for 5-9 week old nursery ;
3. 后备母猪的驯化; Domestication for gilts;
4. 公猪感染; Prevention for boar infection;
5. 自家血清驯化后病毒的降解; Degradation of the virus after domestication with its own serum;
6. 种猪场净化与阴性维持。 Purification and negative maintenance for pig breeding farm.

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3

PRRS灭活疫苗田间试验

Field trial of PRRS inactivated vaccine

4

结论

Conclusion



THANKS
FOR YOUR ATTENTION

谢谢