丹 俄 国 际

DanAg

INTERNATIONAL

李曼中国

Science-driven solutions™

曲东帅 Eddie Qu

Tel & WeChat：18838937270

兽医

Veterinarian

Email Address: eddiequ@danagintl.com

Solutions for discharge after farrowing in sows

母猪产后子宫炎的解决方案

DanAg International
丹俄国际

American system, European management, Chinese solution
美式体系，欧式管理，中国方案

背景介绍
INTRODUCTION

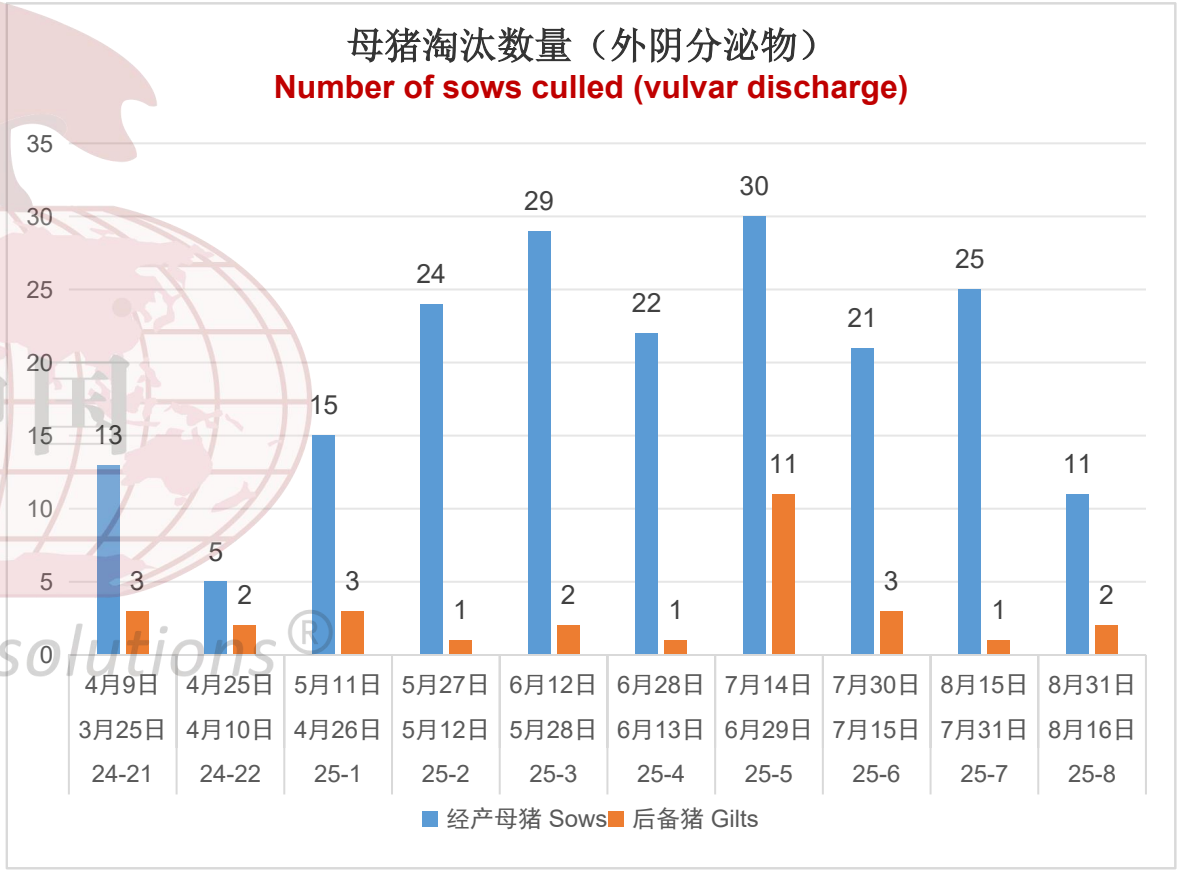
- 子宫炎是导致母猪繁殖力下降的重要原因之一。子宫炎可导致仔猪断奶成活率和均重降低，母猪死亡率、淘汰率和非生产天数增加，母猪受胎率和产子数降低等一系列问题。这严重影响农场的经济效益。Discharge is one of the primary causes of reduced reproductive performance in sows. This condition leads to a series of issues, including decreased weaning survival rates and average weight of piglets, increased sow mortality, culling rates, and non-productive days, as well as reduced conception rates and litter sizes. These consequences significantly impact the economic efficiency of farms.
- 母猪外阴过量分泌物通常被大家叫作子宫炎，但这种说法并不准确。外阴分泌物可能源自于阴道、子宫内膜、膀胱或肾脏。这意味着阴道炎、子宫炎、泌尿生殖道感染和膀胱炎都可能表现为外阴过量分泌物。Excessive vulval discharge in sows is commonly referred to as uterine inflammation, but this term is inaccurate. Discharge from the vulva of the sow can arise from the vagina, uterus or bladder or kidneys.This means that vaginitis, cervicitis, urogenital tract infections, and cystitis may all present with excessive vulvar discharge.
- 并非所有外阴分泌物都是异常现象，透明粘液分泌物是发情期的正常表现，分娩后几天内排出妊娠残留物（恶露）也可视为正常生理现象。Not all vulval discharges are abnormal. Clear mucoid discharge is a normal part of oestrous and a "cleaning out" of the remnants of pregnancy (lochia) in the first few days after farrowing can be viewed as normal.

背景介绍
INTRODUCTION

- 引发子宫炎或泌尿系统感染的病原体包括大肠杆菌、克雷伯氏菌、链球菌、葡萄球菌或猪放线杆菌等。病原体可通过不同途径侵入泌尿生殖道，例如从环境中逆行侵入阴道，继而侵入膀胱及或生殖道（包括宫颈与子宫角）。Infectious agents causing metritis or urinary tract include the Escherichia coli, Klebsiella sp, streptococci and staphylococci or Actinobaculum suis. Infectious agents may enter the urogenital tract via different routes, for example, ascending from the environment into the vagina and then into the urinary bladder and or the genital tract, including the cervix and uterine horns.

背景介绍
INTRODUCTION

- 某规模化农场存在外阴过量分泌物的母猪数量较多。农场需要解决这个问题，提高母猪生产性能。A large-scale farm has a significant number of sows exhibiting excessive vulvar discharge. The farm needs to address this issue to improve sow productivity.
  - 分娩后。影响母猪采食和哺乳，进一步影响仔猪成活率和断奶均重。Postpartum. This affects the sow's feed intake and lactation, further impacting piglet survival rates and average weaning weight.
  - 断奶发情时。母猪淘汰数量增加，达不到配种的目标数量。During the weaning and estrus period, the number of culled sows increases, failing to meet the target breeding quota.
  - 配种后2-3周。降低受胎率和产子数。2–3 weeks after mating. Reduces conception rates and litter size.



研究目的
RESEARCH OBJECTIVE

- 通过实际调查，发现可能造成该农场母猪发生子宫炎的原因。执行并评估针对子宫炎的方案，最终解决农场母猪子宫炎问题。

  Through field investigations, potential causes of discharge in sows at the farm were identified. A targeted treatment plan for discharge was implemented and evaluated, ultimately resolving the issue of sows discharge in the farm.

材料与方法
MATERIALS AND METHODS

- 材料 Materials
  - 封闭生产体系的种猪场，生产节律为16天批次。The GP farm with a closed production system has a production rhythm of 16-day batches.
  - 母猪存栏规模约5700头。The sow inventory is about 5,700 heads.

- 方法 Methods
  - 猪群尿路感染检测。Urinary Tract Infection Detection in Pigs
  - 评估母猪外阴分泌物。Evaluate the vulvar discharge of sows.
  - 分析不同方式对预防子宫炎的结果。Analyze the outcomes of different approaches in preventing discharge.
  - 抗生素和冲宫治疗子宫炎的效果。The effectiveness of antibiotics and uterine lavage in treating uterine inflammation.

制定假设
FORMULATE HYPOTHESES

- 根据该农场发生子宫炎的时间，可以概括为分娩后子宫炎（包括断奶后发情时的子宫炎）和配种子宫炎。 Based on the timing of discharge occurring on the farm, it can be categorized into postpartum discharge (including discharge during post-weaning estrus) and post-service discharge.

- 根据临床症状和现场了解到的信息，推测以下几种原因 Based on clinical symptoms and information gathered at the scene, the following possible causes are inferred:
  - 泌尿道感染 Urinary tract infection
  - 便秘和高温造成的产程过长 Constipation and high temperatures cause prolonged labor in sows.
  - 助产操作 Assisted farrow procedures for sows
  - 胎儿胎衣滞留 Retained fetal and placental tissue
  - 卫生问题 Hygiene

结果与分析
RESULTS AND ANALYSIS

- 研究表明患有泌尿道感染的母猪比泌尿道正常的母猪更易患子宫炎[1]。因此，检查尿液感染有助于识别子宫炎发生的原因。结果显示母猪尿路感染后子宫炎的相对危险度是1.710，95%置信区间为0.632-4.631，P=0.291＞0.05。Studies indicate that sows with urinary tract infections are more susceptible to metritis than those with normal urinary tracts. Therefore, testing for urinary tract infections aids in identifying the causes of metritis occurrence. Results show that the relative risk of metritis following urinary tract infection in sows is 1.710, with a 95% confidence interval of 0.632–4.631, P=0.291 > 0.05.

外阴分泌物 Valvul Discharge	尿路感染 Urinary tract infection		总计 Total	相对危险度（95%置信区间） RR（CI 95%）
	阳性 Positive	阴性 Negative		
阳性 Positive	8	21	29	1.710（0.632-4.631）
阴性 Negative	5	26	31	
总计 Total	13	47	60	

Bilkei G, Bölcskei A, Clavadetscher E et al

结果与分析
RESULTS AND ANALYSIS

- 妊娠后期母猪严重便秘，阻塞的肠道影响胎儿产出，延长了分娩过程。分娩过程越长，病原侵入的概率越大。Severe constipation in sows during late gestation obstructs the intestines, impeding fetal delivery and prolonging the farrowing process. The longer the farrowing process, the greater the risk of pathogen invasion.

- 分娩前5天饲喂硫酸钾镁盐，如果上产后仍然便秘，继续饲喂泻盐直至预产期前一天。 Administer potassium magnesium sulfate five days prior to farrowing. If constipation persists after transfer, continue administering the laxative until the day before the expected due date.

结果与分析
RESULTS AND ANALYSIS

- 使用缓释缩宫素缩短产程 Use of slow-release oxytocin to shorten labor duration.
  - 用于已经启动分娩的母猪，产出2-3头时注射。For sows that have already started farrow, administer the injection when 2-3 piglets are farrowed.
- 结果显示使用缓释缩宫素后，平均缩短产程100分钟，产子间隔缩短9分钟. Results showed that the use of slow-release oxytocin shortened the average duration of farrow by 100 minutes and reduced the interval between piglets by 9 minutes.

组别 Group	母猪头数 Number of sows	胎次 Parity	总产程（min） Total duration of farrow	平均产程（min） Average duration of farrow	产仔间隔（min） Interval between piglets
对照组 Control group	36	1	7360	204	16
	53	>1	14602	276	18
	89		21962	247	18
试验组 Experimental group	21	1	2792	133	9
	63	>1	9521	151	9
	84		12313	147	9
差异 Difference	5		9649	**100**	**9**

结果与分析
RESULTS AND ANALYSIS

- 原本助产操作：不对母猪外阴清洗消毒，使用肥皂水润滑或不使用，甚至不使用手套进行徒手助产。这增加了产道破损及病原侵入产道的风险。Old manual farrowing operation: Failure to clean and disinfect the sow's vulva, using soapy water for lubrication or none at all, and even performing manual farrowing without gloves. This increases the risk of birth canal lacerations and pathogen invasion into the birth canal.
- 建立并培训助产SOP。Establish and train midwifery standard operating procedures (SOP).
  - 助产前使用消毒液擦拭母猪外阴 Wipe the sow's vulva with disinfectant before assisting
  - 每次助产都使用新的长臂手套 Use new long-sleeved gloves for each farrowing assistance
  - 涂抹耦合剂进行润滑 Apply coupling agent for lubrication

结果与分析
RESULTS AND ANALYSIS

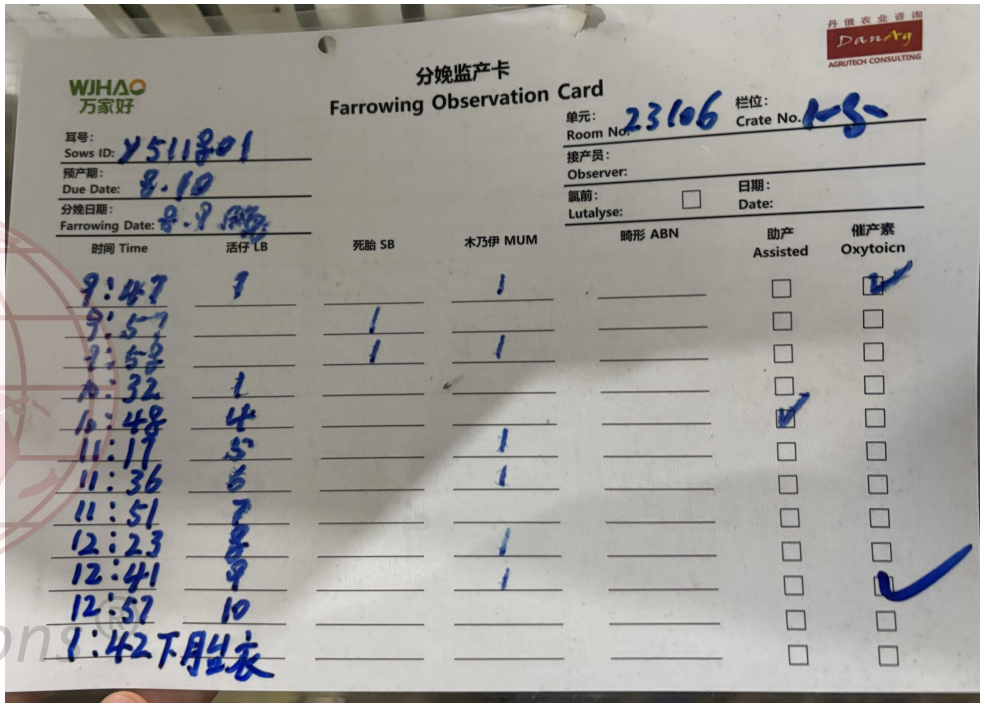
- 部分母猪分娩后几天继续排出死胎或胎衣。调查发现，一个单元母猪分娩结束后工作人员统一注射催产素，一些母猪产后未能及时注射缩宫素，这造成胎衣或胎儿滞留在母猪体内。 Some sows continue to expel dead fetuses or placentas several days after farrowing. An investigation revealed that after farrowing in a unit, staff administered oxytocin injections uniformly. However, some sows did not receive timely injections of oxytocin postpartum, resulting in retained placentas or fetuses within the sows.

- 母猪子宫炎与产后死胎密切相关。 Discharge is closely associated with postpartum stillbirths.

栏位 Pens	耳号 Ear number	助产情况 Assistance	产后掉死胎情况 Postpartum stillbirth	7日龄子宫炎评分 Discharge score for 7-day	10日龄子宫炎评分 Discharge score for 10-day	15日龄子宫炎评分 Discharge score for 15-day	断奶前子宫炎评分 Discharge score for weaning day
1-1	Y128802						
1-2	Y120108						
1-3	Y126604			1			
1-4	Y131602						
1-5	Y127209						
1-6	Y64302						
1-7	Y75207						
1-8	Y62101			1			
1-9	Y61704		是				
1-10	18352						
1-11	Y64702						
1-12	18354						
1-13	Y60608		是	1			
1-14	Y511843		是	1			
1-15	Y69802						
1-16	Y27703			2			
1-17	Y511859		是	2	1		
1-18	Y78404						
1-19	Y86402						
1-20							
2-1	Y131801			1			
2-2	Y128001						
2-3	Y127801						
2-4							
2-5	Y59502						
2-6	Y59701			1			
2-7	Y59403						
2-8							
2-9	Y66904						
2-10	Y61701						
2-11	Y63102						
2-12	Y61504						
2-13	Y60603						
2-14	YK53126	1	是	3	2		
2-15	Y59614L						
2-16	Y61202						
2-17	Y513703						
2-18	Y78004			2	无		
2-19	Y87106						
2-20							

结果与分析
RESULTS AND ANALYSIS

- 使用分娩监产卡，记录分娩信息。每头母猪产出大胎衣后，立即注射缩宫素。对不确定是否分娩结束的母猪，人工助产进行确认。Use the dfarrowing monitoring card to record information. Immediately after each sow expels the placenta, administer oxytocin. For sows where it is unclear whether farrowing is complete, perform manual assistance to confirm.



结果与分析
RESULTS AND ANALYSISS

- 分娩前后几天及时清理产床粪便，降低病原侵入机体的风险。Promptly clean feces from the farrowing crate several days before and after birth to reduce the risk of pathogens entering the body.

- 发情和配种期间的卫生：Hygiene Issues During Estrus and Breeding.
  - 避免将粪便放到母猪屁股下，及时清理。 Avoid placing feces under the sow's hindquarters; clean promptly.
  - 配种前使用一次性纸巾擦拭外阴。Wipe the vulva with disposable paper towels before breeding.
  - 清洗外阴时的污水容易进入阴道引起炎症。Wastewater from cleaning the sow's vulva can easily enter the vagina and cause inflammation.
  - 插输精管时避免损伤阴道和子宫。Avoid damaging the vagina and uterus when inserting the insemination tube.

结果与分析
RESULTS AND ANALYSIS

Science-driven solutions™

■ 已经存在的子宫炎 Existing discharge

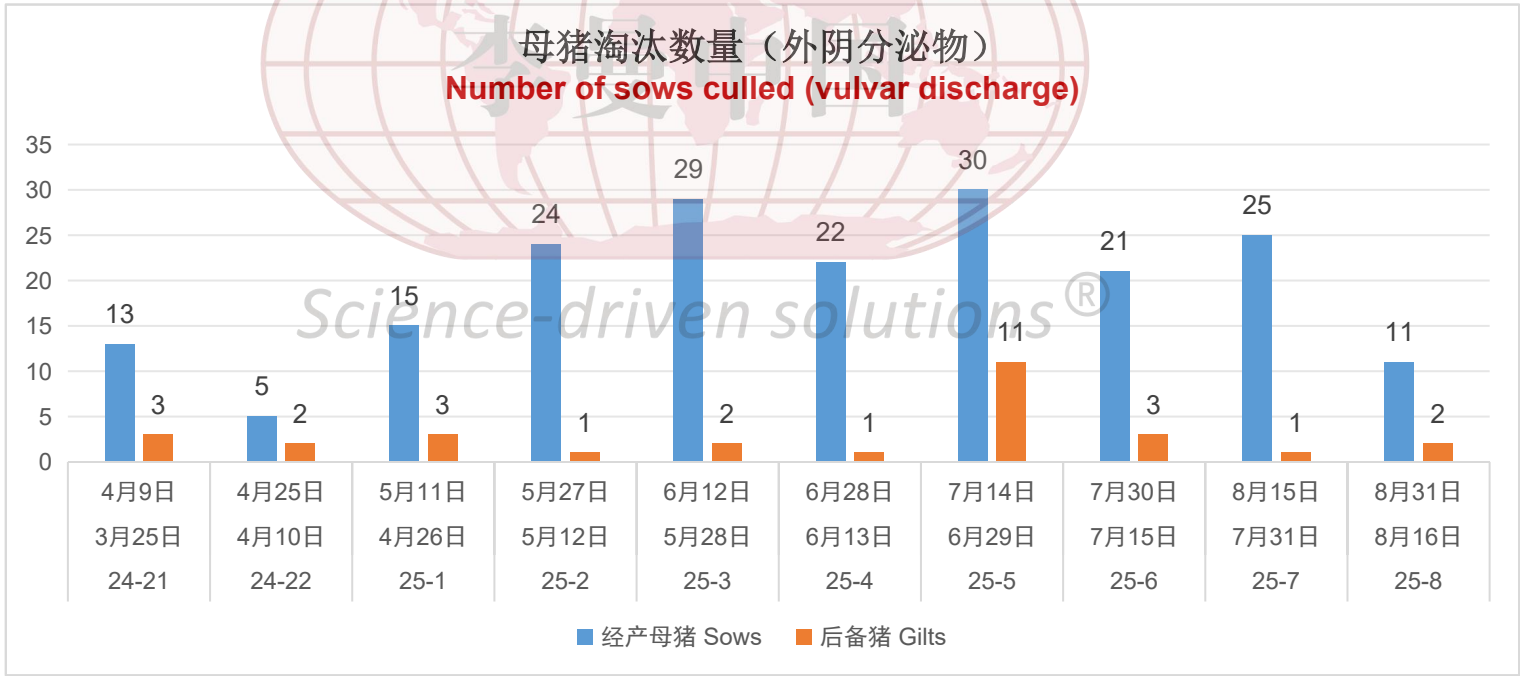
- 尝试不同的抗生素注射治疗。结果显示恩诺沙星对该农场母猪的效果较好。Try different antibiotic injections.The results indicate that enrofloxacin is effective for the sows on this farm.
- 灌洗子宫。治疗后好转的概率为71.43%（5/7）。Uterine lavage.The probability of improvement after treatment is 71.43% (5/7).

单元 Unit	样本数 Sample size	抗生素 Antibiotics	仔猪均重 Avg weigh of weaned piglet	仔猪成活率 Piglet survival rate	母猪死淘率 Sow mortality and culling rate	断奶发情率 Estrus rate	子宫炎数量 Number of discharge	用药成本（元/头） Medicine cost
1	40	氟+青	6.23	85.15%	12.82%	97%	2	14.44
2	40	短效阿莫西林	6.2	84.12%	2.63%	85.29%	2	15.94
3	40	长效阿莫西林	5.95	91.16%	0.00%	83.78%	3	35.85
4	40	恩诺沙星	6.1	91.28%	2.50%	89.19%	2	11.84

序号 No.	栏位 Pens	子宫炎日期 Discharge date		冲宫治疗 Uterine lavage	子宫炎日期 Discharge date	
1	1-3	√	26th Aug.			31st Aug.
2	5-8	√	26th Aug.		√	31st Aug.
3	1-12	√	27th Aug.			31st Aug.
4	2-10	√	27th Aug.	√		31st Aug.
5	3-9	√	27th Aug.			31st Aug.
6	4-11	√	27th Aug.		√	31st Aug.
7	6-12	√	27th Aug.			31st Aug.

结果与分析
RESULTS AND ANALYSIS

- 通过执行针对子宫炎的一系列方案，25-8批次因子宫炎淘汰的母猪数量降低约50%。随着现场人员更加熟练地执行方案，预测子宫炎母猪的数量会逐渐降低。Through the implementation of a series of protocols for metritis, the number of sows culled due to endometritis decreased by about 50% in 25-8 batches. As on-site personnel become more proficient in executing these protocols, it is anticipated that the number of metritis in sows will gradually decrease.



结论
CONCLUSION

- 泌尿道感染不是该农场发生子宫炎的风险因素（RR=1.710，P=0.291＞0.05）。

  Urinary tract infections are not risk factors for uterine inflammation occurring on farms(1.710, P=0.291 > 0.05).

- 缩短分娩产程、规范助产操作、防止胎儿胎衣滞留、降低卫生风险都可能是解决子宫炎症的重要方案。

  Shortening the duration of farrowing, standardizing assist procedures, preventing retained placenta, and reducing hygiene risks may all be important solutions for addressing discharge.

- 对于已经存在的子宫炎，尝试使用抗生素治疗（不同农场的猪只耐药性不同），结合灌洗子宫，可以治疗71.43%的子宫炎母猪。

  For existing cases of uterine inflammation, attempting antibiotic treatment (as antibiotic resistance varies among sows from different farms) combined with uterine flushing can resolve 71.43% discharge sows.

讨论
DISCUSSION

- 不能将所有母猪外阴分泌物简单作为子宫炎处理，泌尿道感染也可能有同样的临床表现。Not all vulvar discharge in sows should be treated as metritis; urinary tract infections may present with identical clinical signs.
- 不同阶段的子宫炎由不同的问题造成，不能一概而论。针对可能的原因实施了一系列方案，因为该农场难以收集相关数据，没有确定具体原因，以解决农场生产实际问题为主。A series of relevant measures were implemented to address discharge. Although the specific cause was ultimately not identified, the farm prioritized production to resolve practical problems.
- 猪只出现健康问题时，未必都是疾病原因，从生产和管理角度分析也能找到解决办法。When pigs have health problems, they may not always be due to disease, and solutions can be found by analyzing them from a production and management perspectives.

致谢

ACKNOWLEDGEMENT

丹俄健康管理团队

Health Management Team of DanAg

丹俄生产管理团队

Production Management Team of DanAg

农场生产团队

Farm Production Team

丹 俄 国 际

DanAg

INTERNATIONAL

感 谢 关 注!

THANKS FOR YOUR ATTENTION!

丹俄农业技术咨询（郑州）有限公司
DANAG AGRITECH CONSULTING (ZHENGZHOU) CO., LTD