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HALAMID®

THE UNIVERSAL DISINFECTANT

Over 60 years proven efficacy



KILCOX EXTRA – HEAVY DUTY DISINFECTANT FOR COCCIDIOSIS

KILCOX EXTRA - 球虫病菌的强力消毒剂

Efficacy Testing 效力测试

The efficacy of Kilcox Extra has been determined in laboratory tests and in field trials against viruses, bacteria and oocysts. This independent testing has proven the product's efficacy against key pathogens and coccidial oocysts. The testing was undertaken in laboratory conditions and on commercial poultry units to ensure a realistic picture of the product potential.

Kilcox Extra has proven effective against viruses and bacteria by the UK DEFRA approval test protocols. These require efficacy at 4°C to simulate a depopulated poultry house in a UK during winter. Most disinfectants show less activity at 4°C than at 20°C so the dilution rates could be increased at higher temperatures. The dilution rates were picked to ensure a pass in these very expensive tests and do not represent the dilution limit for the product.

Kilcox Extra has also been tested at an independent laboratory using the European standard method for bactericidal testing – EN1656. Kilcox Extra proved efficacious at 1:200 against 6 standard organisms using a 15 minute contact time in the presence of hard water and an organic challenge.

Kilcox Extra 对病毒，细菌和卵囊的效力，已在实验室测试和农场试验加以确认。这些独立性的测试，已证明产品对主要病原菌和球虫卵囊的效果。测试是在实验室情况和商业化养鸡场的情况下进行，以确保产品潜能的实际状况。

Kilcox Extra 已在英国 DEFRA 批准使用测试下，证明对病毒和细菌有效。这需要在 4°C 下的试验效果，模拟英国冬天里的一间鸡只减少的鸡舍状况。比在 20°C 下，多数消毒剂在 4°C 时，产生较低的作用效果。因此，在更高的温度下时，稀释浓度可加以增加。选择稀释浓度，以确保能通过这个非常昂贵的测试，而且不能代表产品的稀释界限。

Kilcox Extra 也已在 一间使用欧洲杀菌标准方法 EN1656 的独立实验室测试。Kilcox Extra 已证明在 1:200 的稀释浓度，并且在硬水的存在和一种有机挑战下，使用 15 分钟的接触时间，有效对抗 6 种标准微生物。

DEFRA Test Results DEFRA 测试结果	Dilution 稀释浓度
Swine Vesicular Disease 猪水疱病	1:300
Newcastle Disease 新城鸡瘟	1:110
General Order 一般疾病	1:50

Independent Lab Test results EN-1656 独立实验室测试结果EN-1656	Dilution 稀释浓度
<i>E. coli</i> 大肠杆菌	1:200
<i>Proteus hauseri</i> 变形杆菌	1:200
<i>Staphylococcus aureus</i> 金黄色葡萄球菌	1:200
<i>Enterococcus hirae</i> 肠球菌	1:200
<i>Pseudomonas aeruginosa</i> 绿脓杆菌	1:200
<i>Salmonella cholerasuis</i> 猪霍乱沙氏杆菌	1:200

The oocyst tests used an in vitro test method with oocysts obtained from commercially grown birds. These were subsequently identified as *Eimeria acervulina* & *Eimeria maxima*. Kilcox Extra was able to inactivate or damage 100% of the spores at a 2% concentration. This performance has been supported by reduced infection rates on farms using the product for successive clean downs.

The in-vivo testing used the standard methods utilised by commercial growers to check the efficiency of the clean down regime and the chemicals used. This consists of checking surfaces for contamination after disinfection and sampling the litter during the crop for specific pathogens.

In all cases, the use of Kilcox Extra gave improved results with fewer surfaces having bacterial contamination and reduced levels of litter borne pathogens. This residual activity is crucial to the overall performance increase seen by users of Kilcox Extra. Using the European Efficiency factor which incorporates live weight gain, feed conversion ratio and mortality, the performance of the two initial test farm increased from 280/290 to 320/330 when the only change made was the use of Kilcox Extra.

卵囊测试使用一个体外测试方法，但是使用商业化饲养鸡只而来的卵囊。这些卵囊最终被确认为 *Eimeria acervulina* 和 *Eimeria maxima*。Kilcox Extra 能在 2% 浓度下，非活化或破坏 100% 孢子。这种表现已由农场使用这产品作连续清洗后感染率的降低，获得证实。

体内测试是使用商业化生产者使用的标准方法，以检查清洗层次的效果和所使用的化学物质。这包括消毒后检查污染的表面，并在收集特殊病原菌期间采集垫料样本。

在所有情况下，Kilcox Extra 的使用，获得改善的结果是，受细菌污染的表面减少和介垫料传播病原菌的菌数减少。Kilcox Extra 使用者可看到这种残余作用效果对整体表现的增加是极为重要的。使用欧洲效力评估因素，并配合活体增重，饲料转换率和死亡率，2家初期测试农场的表现，从280/290增加至320/330，唯一的改变是使用 Kilcox Extra。

Oocysts 卵囊

Testing for oocysts requires an infected farm. The normal method is to assess the faecal content for oocysts. A farm in the North East of England showing signs of significant faecal count was used to assess the performance of Kilcox Extra. The ability of Kilcox Extra to incapacitate or damage the walls of the oocysts as viewed under the microscope is a good indicator of efficacy. 100% destruction was achieved at 2% dilution.

卵囊的测试需要一间受感染的农场。正常的方法是评估粪便内含的卵囊。使用英国东北部一家呈现显著粪便受卵囊污染的农场，来评估 Kilcox Extra 的作用表现。就如在显微镜下观察到 Kilcox Extra 使卵囊无法发育和破坏卵囊壁的能力，是效力的一个良好指示。在2% 稀释浓度下，可达至100% 的毁灭作用。

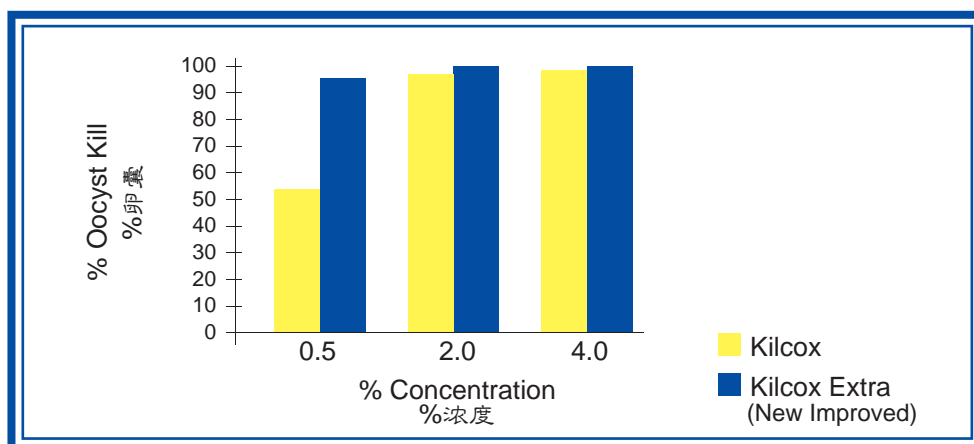


Fig 1: Comparison of percentage kill (%) of coccidia oocyst using different concentration of Kilcox Extra. 图1：使用不同浓度的 Kilcox Extra，杀灭球虫卵囊百分比率(%)的比较。



TURBO TOX



Composition per kg 每公斤的成份

Inactivated *Saccharomyces cerevisiae* 非活动性的酿酒酵母
Mannanligosaccharides (MOS) 甘露寡糖
Diatomaceous earth 硅藻土
Propionic acid 丙酸
Formic acid 蚁酸
Citric acid 柠檬酸

Product features 产品特点

Turbo Tox is a unique combination of 6 ingredients that could act as non-antibiotic growth promoter to improve production parameters such as FCR values, daily weight gain and hen day production. It is a GRAS (Generally Regarded As Safe) product requiring no withdrawal period.

Inactivated dry yeast has good nutritional value, where it provides good quality protein, B-vitamins and some yeast factors.

MOS is related to immune stimulation, pathogen absorption, suppressing pathogen growth indirectly and bind with non-polar mycotoxins.

Diatomaceous earth is a highly absorbent silica compound that binds some pathogenic bacteria and harmful mycotoxins that can be found in raw material. It is due to its high surface area and layers that has great affinity to bind mycotoxin and more importantly, the bond is irreversible. Consequently, minimum mycotoxin is being absorbed into bloodstream.

Short chain organic acids and their salts improve the feed digestibility by lowering the intestinal pH and also have an anti-fungal and anti-bacterial effect both in the feed and in the digestive tract of livestock. The combination has the synergistic power, conferring a potent and rapid effect.

Turbo Tox 是由6个成分组合的独特产品，可以作为非抗生素生长促进剂，以提高生产指数，如换肉率，每日增重，母鸡产量。它是一种 GRAS（一般认为安全）的产品，无需停药期。

非活动性干酵母具有良好的营养价值，它提供了良好的优质蛋白质，维生素B和一些酵母因素。

甘露寡糖是和刺激免疫，病原体吸收，间接抑制病原体的生长，联结非极性的霉菌毒素有关。

硅藻土是一种高吸收性的二氧化硅化合物，可以把在原料里一些致病性细菌和有害的真菌毒素凝结一起。这是因为它有比较大的外表和层积来凝结霉菌毒素，更重要的是，此霉菌毒素凝结是不会逆转的变化。因此，可能只有少数的霉菌毒素会被吸收到血液中。

有机酸和它们的盐份可通过降低肠道的pH值，在饲料中和消化道里具有抗真菌和抗细菌的作用来提高饲料的消化率。这样的组合具有协同的力量，赋予一个强而有力和快速的效果。

Administration & dosage 用法与用量



Poultry 家禽 : 0.5* - 3kg / ton
* Based on Recommendation



Swine 猪 : 0.5 - 1kg / ton



Cattle 牛 : 100g / day / animal



Sheep/goat 绵羊/羊 : 30g / day / animal



Experimental Result 实验成绩

Broilers assigned to 3 treatments (control, 0.5 kg/ ton and 1.0 kg/ ton). Each pens 150 broilers and 4 pens per treatment group.

肉鸡分配给 3 个疗法（对照组，0.5公斤/吨和1.0公斤/吨）。每个疗法有 4 组，每组有 150 只肉鸡。

Body Weight 体重				
	21 days 天	28 days 天	35 days 天	42 days 天
Control 对照组	732	1116	1534	1822
Treatment 0.5 kg/ton 0.5公斤/吨	802	1192	1625	1901
Treatment 1.0 kg/ton 1.0公斤/吨	865	1328	1815	2050

FCR 换肉率				
	5-21 days 天	22-28 days 天	29-35 days 天	1-42 days 天
Control 对照组	1.34 ^a	1.9 ^a	2.08 ^a	1.66 ^a
Treatment 0.5 kg/ton 0.5公斤/吨	1.34 ^a	1.88 ^a	1.96 ^a	1.62 ^a
Treatment 1.0 kg/ton 1.0公斤/吨	1.24 ^b	1.54 ^b	1.82 ^b	1.48 ^b

Sows are fed at 1kg/ton at 90 days of gestation onwards and throughout the lactation period.

从90天妊娠开始和在整个哺乳期，母猪被喂食1公斤/吨。

Criteria 标准	Control 对照	Treatment 治疗	p-value / p 值
No. born alive 出生生存数量	11.23	11.41	0.82
No. pigs weaned 离乳猪只数量	9.8	10.01	0.69
Litter birth wt, kg 出生重量，公斤	16.55	16.68	0.17
Litter wean wt, kg 离乳猪只重量，公斤	61.87	64.02	0.15
Litter wt gain, kg 增加重量，公斤	45.32	47.34	0.14
Lactation feed intake, kg/d 哺乳期采食量，公斤/天	6.9	6.74	0.04
Wean to successful breed, day 离乳后成功孕育，天数	8.80	5.65	0.008



Performance Enhancer
增强表现



Mycotoxin Control
控制霉菌毒素



Bacterial Control
控制细菌



Mould Control
控制霉



Insect Control
控制昆虫

One Product - 5 Functions
一个产品 - 5 个功能

CONTROL OF MYCOPLASMA GALLISEPTICUM IN COMMERCIAL LAYER FARMS

商业化蛋鸡饲养场的败血性霉浆体的控制

Mycoplasma gallisepticum (MG) is a major pathogen in avian species. This highly transmissible organism is the etiologic agent of Chronic Respiratory Disease (CRD) in chickens and may cause severe economic impact to the farm if not controlling well.

M. gallisepticum is an organism similar to bacteria, but lacks a cell wall. It is extremely fragile and easily killed by disinfectants, heat, sunlight, and other factors. They only remain viable in the environment up to 3 days. Hence, MG is easy to eliminate on single-age, all-in all-out poultry farms. However, the farmer will suffer big losses if perform complete depopulation when the farm is infected. Therefore, controlling method is very crucial.

败血性霉浆体 (*Mycoplasma gallisepticum*) 是禽类的一种主要病原菌。这种高度传染性病原体是引起鸡只慢性呼吸器官病 (CRD) 的致病原，如果没有良好的加以控制，可能会严重影响农场的利润。

败血性霉浆体是一个类似细菌的生物，但缺少了细胞壁。它是极为脆弱，并且容易被消毒剂，热，阳光，和其他因素加以杀灭。它只能在环境四周生存长达3天，因此，对于饲养同日龄家禽农场，全进全出家禽饲养场比较容易杀灭败血性霉浆体。然而，如果饲养场受到感染，农民也会蒙受巨大的损失，家禽灭绝。所以控制败血性霉浆体的措施是非常重要的。

Clinical Signs 症状

- | | |
|--|-----------------|
| 1. Sticky, serous exudate from nostrils | 1. 鼻分泌粘，浆液性的分泌物 |
| 2. Foamy exudate in eyes | 2. 眼分泌泡沫的分泌物 |
| 3. Swollen sinuses | 3. 鼻窦肿胀 |
| 4. Respiratory rales and sneeze | 4. 呼吸罗音和打喷嚏 |
| 5. Dropped egg production | 5. 产蛋下跌 |
| 6. Abnormal egg shell that confined to the top cone of the egg | 6. 异常蛋壳，局限于蛋壳尖端 |

Control and Prevention 控制和预防

- | | |
|-------------------------------------|---------------------|
| 1. Vaccination | 1. 疫苗免疫注射 |
| 2. Single age, all-in all-out farms | 2. 饲养同日龄家禽，全进全出家禽饲养 |
| 3. Biosecurity | 3. 生物安全措施 |

Single Age 同日龄家禽

- Mycoplasma lacks of cell wall, it is very fragile. Viable in the environment, outside the chicken up to 3 days. Hence easily to eliminate in all-in all-out farm.
- If a flock is infected, complete depopulation and provide enough time before reintroducing new layer.
- 霉浆体缺乏细胞壁，它是非常脆弱。它只能在环境四周维持长达3天的生存。因此容易清除在全进全出的农场。
- 如果饲养场感染鸡败血支原，家禽灭绝，也有足够的时间在还没引进新批次的家禽时消毒。

Biosecurity 生物安全措施

- Mycoplasma not only spread via air-borne route, it can be spread by movement of contaminated people, equipment and vehicles. Hence, using proper disinfectant to control the spreading of Mycoplasma.
- Wild bird can get infected and shed Mycoplasma. Hence, wild-bird-proof poultry house can limit the spread of Mycoplasma.
- 霉浆体不只介空气途径，也可以通过被污染的人，设施和车辆的移动而传播。因此，使用适当的消毒剂可控制霉浆体的传播。
- 野鸟可受到感染并排出霉浆体。因此，防止野鸟进入鸡舍可以限制霉浆体的传播。

Vaccination 免疫注射

Studies have shown that Mycoplasma vaccination can reduce drops in egg production following infection, maintaining levels of egg production throughout the cycle, reducing severity of concurrent respiratory disease, reducing sensitivity to poor air quality and limiting shed level and duration of Mycoplasma in the poultry house environment.

Fatro's MYC-VAC is an inactivated vaccine which manufactured from highly immunogenic strain of *Mycoplasma gallisepticum*. The culture is inactivated and emulsified in light mineral oil to enhance and lengthen the immunogenic effect.

研究显示，经过感染后，霉浆体的免疫注射可降低蛋产的下跌幅，在整个生产周期里保持蛋的产量，降低并发呼吸器官病的严重程度，降低对品质不良空气的敏感度，限制排菌量和霉浆体在鸡舍环境内的生存期限。

Fatro的MYC-VAC是一种由高度免疫败血性霉浆体菌株培制的非活化疫苗。培制体是经过非活化，并在轻度矿物质油里乳化，以便提升和延长免疫性效果。

Usage 剂量

A high degree of protection is obtained after first vaccination, however this immunity is stronger and last longer after the second inoculation.

The vaccine can be administered by subcutaneous injection in the back of the neck or intramuscular of breeders and layers at the dose of 0.5ml.

First vaccination at 10-12 weeks, booster dose 4 weeks point of lay.

第一次免疫注射后，可获取高度的免疫保护作用，然而，第二次接种后，这种免疫能力更强和持续更久。

这疫苗可在颈部后方进行皮下注射，或对种鸡和蛋鸡以0.5毫升剂量作肌肉注射。

第一次免疫注射是在10至12周时进行，产蛋4周期限内投于补强剂量。



Fig 1: Abnormal egg shell that confined to the top cone of the egg.

图1：蛋顶圆锥形成的不正常的蛋壳



Fig 2: Watery and reddish eyes and serous excretion from nostril.

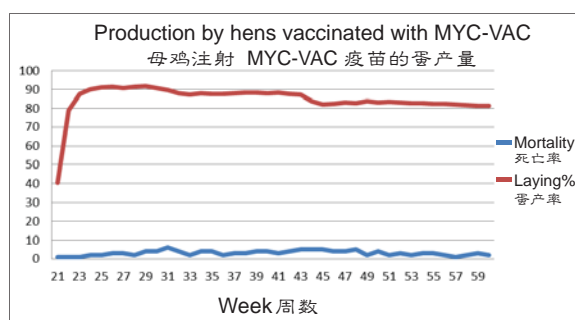
图2：水汪汪红眼和从鼻排出的浆液性分泌物



Trial Result 试验结果

Parameters 项目	Control 对照	1 st vaccination 第一次免疫注射	2 nd vaccination 第二次免疫注射
No of chicken 鸡只数目	10	10	10
Day of vaccination 免疫注射日数	-	45 days 天	100 days 天
Route 免疫注射途径	-	Subcutaneous 皮下注射	Subcutaneous 皮下注射
Volume of vaccine 疫苗容量	-	0.5ml	0.5ml

Parameters 项目	HI mean 血球凝集抑制(HI)平均值			ELISA		
	Control 对照	1 vaccine 疫苗1	2 vaccine 疫苗2	Control 对照	1 vaccine 疫苗1	2 vaccine 疫苗2
Days post vaccination 免疫后天数						
0 days (1st vacc) 0天(第一次注射)	< 1: 5	< 1: 5	< 1: 5	181	181	181
55 days (2nd vacc) 55天(第二次注射)	< 1: 5	1: 66.15	1: 55	132.16	494.61	466.75
69 days 69天	< 1: 5	1: 101.66	1: 266.66	106.50	653.33	716.66
106 days (challenge) 106天(挑战)	< 1: 5	1: 120	1: 303.33	112	638.91	678
129 days 129天	1: 240	1: 260	1: 472.72	303	681.41	723.45



Conclusions 结论

The trial demonstrated the optimum tolerability of the MYC-VAC vaccine which inoculated twice by subcutaneous route in the neck and had high efficacy in terms of the specific antibody response against MG. Throughout the 40 week production period, complete absence of problems of disease associated with MG, together with an excellent level of production/quality of eggs.

试验证明MYC-VAC疫苗在颈部皮下注射2次所显示的优越耐受程度，以及对抗败血性霉浆体特著抗体反应表示所呈现的高效果。在整个40周的生产期限里，完全没有发生与败血性霉浆体有关的呼吸性疾病问题，并且有优越的蛋产量/品质优越的鸡蛋。

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PIGLETS DIARRHOEA - MANAGE IT

管理仔猪下痢



Piglet diarrhoea, it is a most common yet important disease in the suckling piglets. It may account up to 0.5% mortality in well managed herd nonetheless it can reach up to 7% mortality or more in severe outbreaks. The most common causes of diarrhoea in pre-weaning piglets are colibacillosis, hypoglycemia, transmissible gastroenteritis (TGE), clostridial enteritis (CE), coccidiosis, and rotaviral enteritis (RE). Other diseases that may cause diarrhoea in piglets include strongyloides infestation, swine dysentery (SD), erysipelas and salmonellosis.

Diarrhoea occurs when the delicate balance of agents load, immunity strength of the piglets and environmental stress is tilted. Thus to control and prevent diarrhoea, all factors that may jeopardise the balance should be taken into consideration.

At birth, the intestinal tract of the piglet is micro-biologically sterile and has little immunity against disease producing organisms. Yet, organisms start to colonise the tract rather quickly after birth, among them potentially pathogenic strains of *E. coli* and *Clostridium perfringens*. At this stage, piglet depends on the antibodies contained in colostrum to line the intestinal wall as to prevent multiplication of pathogenic organisms in the tract and causes diarrhoea. It is essential that the piglet continues to drink sow milk regularly after the colostrum has gone so that its intestines continue to be lined by protective antibodies.

To ensure constant supply of adequate milk, sow health condition is a major factor and needs to be monitored. Sow troubled by illness usually tend to eat less, drink less and will not be competent to supply sufficient antibodies in milk, diseases such as mastitis-metritis-agalactia (MMA) will decrease the amount of milk available for the piglets. Other than that, the condition of farm facilities may also affect the accessibility of piglets to the milk source, for example slippery floor, bars on the farrowing crate that hinder nursing.



Cross-fostering program can be adopted in piglets with big litter size to ensure all the piglets get sufficient supply of milk. It is best done before day 4 and involves piglets of good condition. The use of supplementary milk is not encouraged as increased diarrhoea incidence was observed in some studies. Antibody level in milk can be improved by appropriate vaccination program. Studies also observed that piglets treated with iron supplement have less diarrhoea problem as they are more immune-competent.

However, the antibodies acquired from the colostrum and milk are limited and can be overwhelmed by large doses of pathogens present in the environment. As the number of pathogens taken in increases, the risk of contracting disease becomes higher. Thus, it is important to maintain a low-pathogens-load environment for the young. Proper disinfection after cleaning helps to lower the pathogens in the environment at a great scale. This proper disinfection usually can only be achieved if one is practising an all-in-all-out management. Deworming and washing of sows before admitting sows into the farrowing crates proved to lessen the pathogen loads in the farrowing crates.



The resistance of piglets against diseases is also affected by environmental stress such as chilling and post-castration stress. Therefore, management should aim to keep the piglets warm and avoid draught. Studies showed that, the piglets will be least affected if castration is to be done within day4 to day14.

Managing to prevent piglet diarrhoea is not an easy task but the results are very rewarding when the piglets are weaned with a healthy gut and better body weight.

仔猪下痢，对吮吸中的仔猪，是一种非常普遍，但也是非常重要的疾病。在严重爆发时死亡率可高达7%或更高，但管理良好的猪场，死亡率可达0.5%。引起离乳前仔猪下痢的最普遍原因为大肠菌症，低血糖症，传染性胃肠炎(TGE)，梭菌性肠炎(CE)，球虫病，轮状病毒肠炎(RE)，其他可引起仔猪下痢的病原包括，类圆虫属，猪赤痢(SD)，丹毒和沙氏杆菌症。

当病原菌负荷的柔性平衡，仔猪的免疫力强度和环环境紧迫受到干扰倾覆时，下痢便发生。因此，为了控制和预防下痢，所有可危害生态平衡的因素都应该加以考虑。

在出世时，仔猪的肠道是无菌微生物性，对生产疾病微生物的免疫抵抗力较低。而且，病原菌在仔猪出世后，以相当快的速度，开始在肠道里群集成菌落，当中，有潜在致病性大肠杆菌和产气荚膜梭菌株。在这阶段，仔猪依靠初乳内含有的抗体来保护肠道壁，以便预防病原菌的繁殖以引起下痢。初乳停止供应后，仔猪应该经常

继续摄取母乳，以便保护性抗体继续保护着肠道。

为了确保足够乳量不断的提供，母猪的健康状况是一个主要的因素，而且必须加以监视。受疾病干扰的母猪，通常倾向于较少量采饲，饮用水分较少量，并且没有能力在乳汁内提供足够的抗体。疾病如乳房炎-子宫炎-缺乳症(MMA)，将会减少提供于仔猪的乳量。除此之外，农场设施的状况，也会影响仔猪移动到达提供乳汁的来源，如滑地板，阻扰哺育仔猪的分娩舍铁枝。

对仔猪数量多的胎次，可以采纳交叉哺育计划来确保所有仔猪获得足够的乳量供应。最好是在第4天前进行，仔猪身体状况必须良好。不鼓励使用补充性乳汁，因为有些研究报告显示这样会导致到下痢的情况会增加。乳汁内的抗体可以借助免疫注射计划加以改善。研究观察也显示，以铁质治疗的仔猪，下痢的问题较少发生，因为他们有较强的免疫能力。

然而，从初乳和乳汁获取的抗体有限，而且可被大量存在于环境里的病原菌埋没。当摄进身体内的病原菌数增加，患病的危害程度变为更高。因此，对年幼的猪只而言，保持低病原菌负荷的环境是重要的。清洗后的正确消毒，可大幅度地协助降低环境里的病原菌。这种消毒只有在施行统进统出的饲养管理才可以达致目的。驱虫和母猪未引进分娩舍之前的清洗，证明可降低分娩舍内的病原菌数。

仔猪对疾病的抵抗也受环境紧迫，如寒冷和阉割紧迫的影响。因此，饲养管理应该以保持仔猪温暖和避免干旱为目标。研究显示仔猪于第4至14天内进行阉割，将受到较少的影响。

管理预防仔猪下痢不是一项容易的工作，但是，当仔猪是在肠道健康和很好的体重下离乳，农场是会有非常好的酬劳回报。

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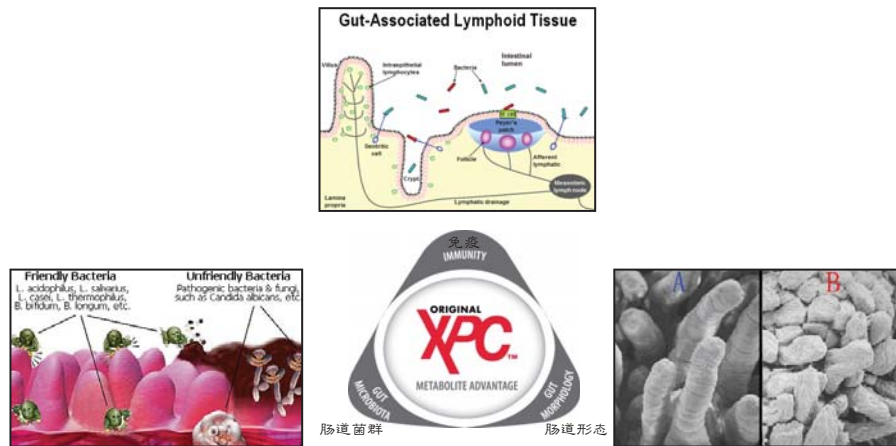


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 4. Reduce pre-weaning mortality
 5. Improve litter weaning weight - average about 3kg per litter
 6. Reduce number of days to breeding
 7. Improve FCR
 8. Reduce overall medication cost
 9. Risk management on E.coli challenge
 10. Mycotoxin challenge: comparable result with yeast cell wall, yeast blend cell wall blend and clay based products
 11. Comparable result with cell wall product supplementation
 12. Comparable result with chlortetracycline antibiotic growth promoter
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 2. 增加仔猪出生率
 3. 提高母猪的奶产量
 4. 减少离乳前死亡率
 5. 提高离乳猪只重量 - 平均每窝约3kg
 6. 减少繁殖的天数
 7. 提高换肉率
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 9. 管理大肠杆菌的风险挑战
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 11. 可与细胞壁补充的产品比较其效果
 12. 可与金霉素抗生素的生长促进剂比较其效果

Mode of Action 行动模式



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Feeding Diamond V Original XPC in the presence of Aflatoxin resulted in significantly improved feed intake & numerically improved body weights

在黄曲霉毒素的存在下喂饲 Diamond V Original XPC，
显示著提高饲料摄取量和改善体重数值的结果

Aflatoxin (AFL) is one of the most well-known mycotoxins because of carcinogenic activity and the only mycotoxin with FDA action levels in food and feed. AFL is most prevalent during above average temperatures and below average rainfall, making this crop year ideal for increased AFL levels. Research previously conducted at Iowa State University has shown that feeding Original XPC can help alleviate the stress from feeding AFL to broilers.

AFL can be found in grains prior to harvest (drought and insect damaged) but is also a common storage toxin in grain containing Aspergillus fungi and improperly dried before storage. Unlike other mycotoxins, AFL can be produced in grain at lower moisture and is more commonly found in warmer climates. AFL is commonly found in grain at lower levels than Fumonisin or Deoxynivalenol (DON), but is one of the most toxic mycotoxins. For this reason FDA action levels are only listed for AFL (20 & 100 ppb in corn for young and mature poultry, respectively), which are legally enforceable. Only guidance and advisory levels (not legally enforceable) are suggested by FDA for fumonisin and DON.

There has been a large amount of research testing the effects of clays and their ability to bind AFL in poultry (or aqueous solutions, in vitro). Feeding Diamond V Original XPC™ can help balance the immune system and allow the animal to better handle stress. Research was also conducted by Osweiler et al (2010) at Iowa State University, testing the tolerance effects of feeding Original XPC to broiler chicks exposed to stress from AFL consumption. The objective of this research was determine the effect of feeding Original XPC in reducing the negative impacts of AFL on growth performance and liver toxicity in broilers.

黄曲霉毒素是其中一种最为人知的霉菌毒素，是因为其致癌功能和受 FDA 管制的唯一霉菌毒素含量在食物及饲料里。黄曲霉毒素是在平均温度以上和平均降雨量以下时最为盛行，促使农作物在这种收割期下，成为增加黄曲霉毒素含量的理想环境。由爱尔兰国立大学过去进行的研究显示，喂食 Original XPC，可减轻肉鸡喂于黄曲霉毒素后所产生的紧迫。

黄曲霉毒素可在谷物还未收割之前找到(干旱和害虫破坏)，但谷物在储存前没有正确地加以烘干也可常见曲霉真菌毒素。它与其它霉菌毒素不一样，黄曲霉毒素可在较低水分下的谷物内产生，更常在较温暖的气候下找到。在谷物里常找到的黄曲霉毒素，比伏马菌素(Fumonisin)或呕吐毒素(Deoxynivalenol)的含量比较低，但它是其中一种最毒的霉菌毒素。也因为如此，FDA在管制霉菌毒素行动的列表里，只对黄曲霉毒素有合法强制性管制(对年幼和成长家禽，玉米内含有的霉菌毒素允许含量分别为20和100ppb)。至于伏马菌素和呕吐毒素的含量，FDA只有提出指导和忠告建议(没有强制性执法)。

Diamond V 已有进行许多研究测试粘土的效果和在家禽体内结合黄曲霉毒素的能力(或在体外的水性液体中)。喂食 Diamond V Original XPC™ 可协助平衡免疫系统，并让动物能更好的处理紧迫。爱尔兰国立大学 Osweiler 学生等人于 2010 年也进行研究，测试肉小鸡摄取黄曲霉毒素后面对紧迫时喂饲 Original XPC 的耐受效果。这项研究的目的是确定喂饲 Original XPC 在降低黄曲霉毒素时对肉鸡生长表现和肝中毒的负性影响。

Materials & Methods 材料和方法

- 120 male Ross 308 broiler chicks
- Fed experimental diets from 6 to 33 days of age (28 days).
- Broilers fed 2500 ppb Aflatoxin B1 (AFB1; except negative control)
- Treatments dietary inclusion level:
 - Negative control (NC) - No additive, no Aflatoxin challenge
 - Positive control (PC) - No additive, Aflatoxin
 - 0.1% Industry available standard (STD) - Glucomannan, Aflatoxin
 - 0.0625% XPC (XPC1) - XPC, Aflatoxin
 - 0.125% XPC (XPC2) - XPC, Aflatoxin

Each treatment consisted of 8 replicates pens of 3 birds/replicate
Weekly performance measured during 28 days on experimental diets
Feed intake, body weight and feed conversion (FCR)

Other variables measured at 33 days of age:
Liver weight - relative to body weight
Liver vacuole score - 0 = no lesions, 1 = mild, 2 = moderate, 3 = severe

- 120 只 Ross 的雄性，308 肉小鸡。
- 从 6 至 33 天龄(28天)喂饲试验性饲料。
- 肉鸡喂饲 2500 ppb 黄曲霉毒素 B1 (AFB1, 负性对照组 (NC) 除外)
- 试验处理饲料添加量:
 - 负性对照组 (NC) - 没有添加剂，没有黄曲霉毒素挑战
 - 正性对照组 (PC) - 没有添加剂，有黄曲霉毒素
 - 0.1% 工业标准 (STD) - Glucomannan, 有黄曲霉毒素
 - 0.0625 % XPC (XPC1) - XPC, 有黄曲霉毒素
 - 0.125 % XPC (XPC2) - XPC, 有黄曲霉毒素

每一个处理组别包含 8 个复制舍栏，每个复制舍栏3只鸡喂饲 28 天试验性饲料期间，测试每周的生长表现饲料摄取量，体重和饲料转换率 (FCR)

33 日龄时测试其他变数：
肝重量 - 相对于体重
肝空泡 - 0 = 没有病变，1 = 轻微程度，2 = 中等程度，3 = 严重程度

Results 结果

Fig 1: Overall feed intake for 28 days on experimental diets
图1：喂饲28天试验性饲料的肉鸡整体饲料摄取量

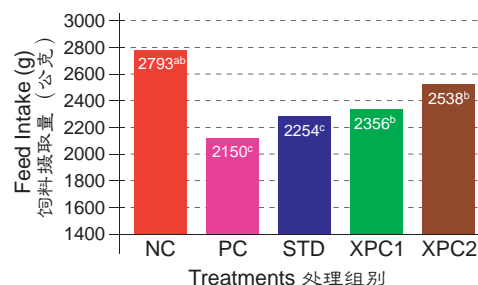
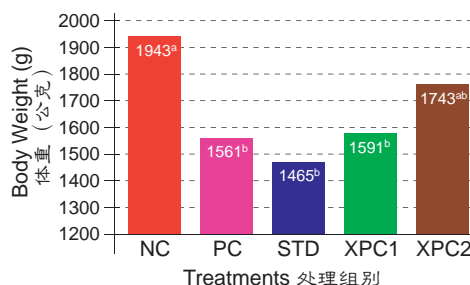


Fig 2: Final body weights at 33 day of age
图2：33日龄的最终体重



^{ab} Means with the same superscripts are not significantly different ($P > 0.05$)
^{ab} 具有同样上方英文小字体的平均值，没有显著的差 ($P > 0.05$)

- Broilers fed AFB1 alone (PC) had reduced ($P < 0.05$) overall feed intake and final body weight compared the birds fed no AFB1 (NC). No differences in feed conversion were found in the study ($P > 0.05$).
- The authors reported that only the birds fed AFB1 alone (PC) or in combination with the industry glucomannan product (STD) had significantly lower feed intake compared to controls not fed AFB1 (NC; Figure 1). Broilers fed either level of XPC had similar feed intake as broilers fed no AFB1 (NC; $P > 0.05$).
- No statistical improvement ($P > 0.05$) in final body weight was observed from feeding any additives over that of the AFB1 alone (PC; Figure 2). However, broilers fed 0.125% XPC had statistically equivalent body weights ($P > 0.05$) as the birds fed no AFB1 (NC).

- 肉鸡只喂饲黄曲霉毒素 B1 (PC) 比没有喂饲黄曲霉毒素的鸡只 (NC) 降低整体饲料摄取量 ($P < 0.05$) 和最终体重。此研究显示饲料转换率没有多大的差别 ($P > 0.05$)。
- 研究者报告指出, 只喂饲黄曲霉毒素 B1 (PC) 或混合工业提供的 Glucomannan 产品 (STD) 的鸡只, 比没有喂饲黄曲霉毒素 B1 (NC) 的对照组鸡只, 显著降低饲料摄取量 (NC; 图1)。喂于任何含量 XPC 的肉鸡与没有喂饲黄曲霉毒素 B1 (NC) 的肉鸡 (NC; $P > 0.05$) 有一样的饲料摄取量。
- 在最终体重方面, 喂饲任何添加剂, 比只喂饲黄曲霉毒素B1的肉鸡没有明显差别 (PC; 图2) ($P > 0.05$)。然而, 喂饲 0.125% XPC 的肉鸡, 就如没有喂饲黄曲霉毒素B1的肉鸡 (NC) 一样, 有显著同等的体重 ($P > 0.05$)。

Fig 3: Relative liver weight (percentage of body weight)
图3 : 相对肝重量 (体重百分比率)

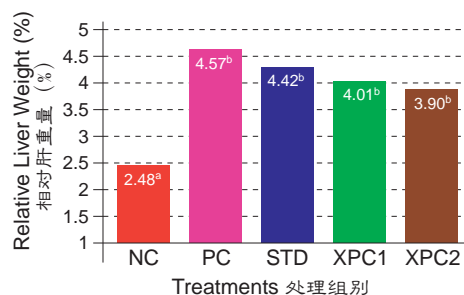
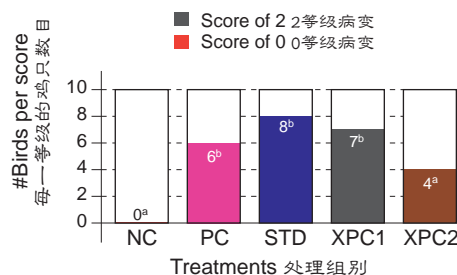


Fig 4: Liver vacuoles lesions, number birds positive (score of 2) of 8 birds tested
图4 : 肝脏空泡病变, 8只测试鸡只有正性反应的鸡只数目 (2等级病变)



ab Superscripts same as control are not significantly different from control ($P > 0.05$)
ab 与对照组拥有一样的上方小英文字体, 与对照组没有显著的差别 ($P > 0.05$)

Feeding AFB1 significantly increased ($P < 0.05$) liver weight, as a percentage of body weight (relative liver weight; Figure 3). There was no significant reduction ($P > 0.05$) in relative liver weight in the additive groups compared to AFB1 only group (PC). However, the authors did report that relative liver weights were lowest in the XPC treatments.

As for liver microscopic lesions, feeding AFB1 alone (PC) significantly increased the number of birds with moderate liver vacuolation (6 out of 8 birds necropsied had lesion score = 2; Figure 4). The authors reported that broilers fed 0.125% XPC had vacuolar lesion scores not significantly different from those in the NC group (no AFB1 fed). Liver lesions and enlargement are biomarkers of aflatoxicosis, which are difficult to prevent when such high levels of AFL are fed.

喂饲黄曲霉毒素B1显著肝重量增加 ($P < 0.05$), 以体重百分比率 (相对肝重量; 图3)。只喂饲黄曲霉毒素B1的组别 (PC), 与添加剂组鸡只的相对, 肝重量没有明显的降低 ($P > 0.05$)。然而, 研究者有报告显示XPC处理组的相对肝重量为最低。

至于肝脏的显微病变, 只喂饲黄曲霉毒素B1 (PC) 的鸡只, 显著患有中等程度肝空泡化鸡只的数目增加 (8只鸡中6只剖检发现病变等级=2; 图4)。研究报告显示喂饲 0.125% XPC 的肉鸡有肝空泡化病变等级, 与负性对照组 (NC-没有喂饲黄曲霉毒素), 没有显著的差别。肝脏病变和肝肿大是黄曲霉毒素症的生物性指标, 这是不容易加以预防的病症如果饲料里含有高量的黄曲霉毒素。

Conclusion 结论

Feeding Original XPC can help balance the immune system, potentially allowing the animal to better handle stress. Consumption of Aflatoxin is an added stress to the birds which can be compounded with other environmental and production stresses. The stress from feeding Aflatoxin resulted in a reduction in body weight, most likely resulting from reduced feed intake (as reported in previous published research). Feeding 0.125% XPC, the recommended inclusion rate for broiler chicks, helped alleviate the stress of Aflatoxin in this study even at levels much higher than found naturally in grain.

喂饲 Original XPC 可协助平衡免疫系统, 让动物有更良好的处理紧迫。黄曲霉毒素的摄取, 对鸡只是一种额外的紧迫, 它可以和其他环境和生产紧迫配制。喂饲黄曲霉毒素引起的紧迫, 可导致体重减轻, 这很可能是因为饲料摄取量减低所造成 (在过去发表的研究里有所报告)。喂饲0.125% XPC, 供肉小鸡的建议添加量, 可协助减轻在研究里喂饲黄曲霉毒素的含量所引起的紧迫, 甚至更高过于自然存在谷物内的含量。

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