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AGWA CLEAN AND ITS APPLICATION TO PIG FARMING

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ABSTRACT

AGWA Clean, a product based on silver peroxide, has proven efficacy in removing biofilm from the internal surfaces of water systems and as a surface disinfectant in the poultry industry.

A similar trial was conducted on a 420 sow breeder / finishing unit in North Yorkshire. The farm had long - standing problems with PMWS (Post Weaning Muscle Syndrome), but has used good management practices, and recommended bio security measures, to control the disease.

The formulation removed considerable quantities of biofilm. (A microbiological based ecosystem which films on the internal surfaces of water delivery pipe work and can host dangerous pathogens). This improved the quality and the quantity of water supplied to the pigs.

The work demonstrates the importance of water system cleanliness in improving pig health. The trial of the formulation confirmed poultry industry findings. There was a marked increase in overall health, a visible improvement in piglet weight, from weaning through to finishing and a consistent reduction in mortality. Vice, (tail and flank biting) which had become a serious problem has been reduced to pre PMWS levels.

While the formulation is not a cure for PMWS its use produces healthier, fitter animals, which are better able to combat the disease. The formulation is therefore a useful weapon in the fight against PMWS and for general improvement in pig welfare.

INTRODUCTION

Trials over 2 years have shown that a solution of AGWA Clean consistently produced heavier fitter birds and reduced mortality when applied to the drinking water in broiler houses.

The formulation has unique biofilm removing capability and quantities of slime are removed from any water system within the first few days of treatment.

This is important as the biofilm hosts a number of dangerous microorganisms, which could produce a serious challenge to the pigs. (salmonella, e coli, camphylobacter and other organisms can develop in water system biofilms)

Pilmoor Grange, a pig farm with mature PMWS decided to trial AGWA Clean to establish whether it had any benefits for the pig industry. The product was trialled both as a Terminal Disinfectant and as a Water System Sanitiser.

The terminal disinfectant was incorporated into the existing management system of disinfection after the building had been power washed clean. This process was done on a week-by-week basis, starting at Farrowing Houses No1 and 1a and extended through the unit in subsequent weeks. As the farm uses two separate rooms for each weeks farrowing it allowed a direct comparison between the new formulation and the disinfectant being used by the farm at that time.

Water disinfection was conducted on the same basis. The water treatment being introduced at Farrowing House 1 and 1a with 1a being used as the control. This procedure was also extended through the unit on a week-by-week basis.

Water treatment and disinfection on the farm changed progressively to follow the course of weaned piglets leaving the farrowing house's and subsequently entering the weaning pens and then into the grow out accommodation.

The following part of the report is based mainly on the comments of the farm owner David Wilkinson and his manager Wayne Ducker.

Technical comments on the properties of the formulation are given where appropriate.

TERMINAL DISINFECTION

After cleaning of the farrowing houses AGWA Clean was applied as a mist through a fogging machine.

This biofilm removal is a major benefit over competitor products. The bio film layer harbours dangerous pathogens and microbes. Failure to remove biofilm can result in regeneration of bacteria at exponential rates with serious consequences for young weaners.

Mr Ducker (unit manager) commented:

“The formulation effervesces when it contacts dirt. It therefore exposes the areas, which were not properly cleaned, and indicates the problems of carrying dirt on boots back into the shed after cleaning and prior to disinfection. This changed the way things were done in that we ensured the area outside the sheds became a clean area to prevent transport of dirt.

The fogging technique reduces the quantity of disinfectant used. The volume of water used is reduced by 90%. The formulation appears to stay active on the floor for longer than the conventional disinfectant.”

Independent test work verified that AGWA Clean stayed active for up to 72 hours following application. The product is a slower acting chemical than competitive products (VirkonS or Sorgene) but the stability of AGWA Clean ultimately produces a better result.

DISINFECTION OF DRINKING WATER

1. The Importance of good drinking water

References 1 and 2 demonstrate that high quality drinking water is an essential component for the health and efficient production of pigs. Reference 1 indicates that water intake is also important and that if adequate water is not provided to the pig, feed intake and subsequent growth performance will be reduced.

Biofilm form easily in farm water distribution systems because the pipework is normally fabricated in plastic materials, the water supply is generally untreated and the water temperature can be affected by conditions in the shed. Biofilm develop best at temperatures of 25⁰ C – 45⁰ C. Farrowing house and First stage weaner accommodation temperatures are therefore conducive to promoting biofilm growth within water pipe work, particularly in the weaner accommodation where the drinking habits of newly weaned pigs means that water can stay static in the pipe work for long periods

The biofilm acts as an adhesive for a diverse ecosystem of microorganisms, scale, and salts. The biofilm will therefore contain bacteria, spores protozoa and possibly even eggs of intestinal worms.

Bacteria, which use inorganic ferrous iron, as an energy source can be particularly problematic, because they produce a red slime, which can block water lines and nipple drinkers. Water supplied to animals should contain less than 100 total bacteria per ml and fewer than 50 Coliforms per ml.

100 ppm AGWA 50 was introduced into half of the farrowing house accommodation after the water storage tank had been cleaned and disinfected.

Mr Ducker Comments

“Water is an essential ingredient. Because it’s always been there not a lot of thought had been given to it. Using the formulation as a water treatment has made us look at our water and the way we use it on the unit. More than anything else it has made us look at the cleanliness of our water system.

We realised that although we spent a lot of time cleaning buildings we never cleaned the water system properly. We would strip out pipework once or twice a year and wash it through. Having used the formulation, which removes all the build up of biofilm within the pipes we now realise that although we pressure washed them out, we didn’t actually remove much of the build up of scale and biofilm inside the pipework. To a certain degree we had been wasting our time.

The most noticeable thing we have seen is the improvement and evenness of the flow through the nipples, no matter what distance from the header. We are now also seeing a reduction in time spent washing throughout the unit because the formulation is in the water when we wash and is constantly removing the bio film that has built up over the years on the walls and floors.”

It should be stated that within the first week of applying the formulation to the system a large quantity of black / brown deposit came out of the water system. Management needs to be aware that this is highly likely to result in blocked nipple drinkers and consequent water shortage problems if time is not taken to check all water outlets daily during this initial period. We recommend that water treatment be initiated in easy stages if possible. Following biofilm removal the animals enjoyed a consistent supply of good quality sterile water.

Pilmoor have systematically applied the formulation to the water supply to all of their livestock buildings.

Mr Ducker comments as follows

Farrowing House

“Having been at Pilmoor for 4 summers I believe that this year for the first time we have managed to keep intake of food into the lactating sows in accordance with the Stotfold Scale. We have been using this scale for the past 4 years but each year we have struggled to keep intake up. We have also seen more wastage of food in previous years I believe that this indicates:

- 1. A better water supply*
- 2. More importantly the water is better to drink because of the removal of the biofilm from the internals of the pipework. This has resulted in a much higher water intake and the subsequent benefits of that increased intake.*

The plus from all of this is that we have been able to maintain good weaner weights which we know is important in combating PMWS at a later stage. Plus sows have kept in good condition within the farrowing houses so we have kept days to service to an average of 5 whereas normally in summer we would tend to see a small percentage taking between 5 –20 days to come on after weaning.

Unfortunately some sows within the first batches of weaned animals that had been on the water treatment from the start did return to service. While others went on to have much lower litter numbers born alive at their next parity. This was attributed to going back to dirty water in the dry sow accommodation and since the inclusion of these buildings in the programme this problem has been resolved.”

Weaned Pigs

“Although we do not weigh our pigs out of the grower accommodation one can see just by eye that the pigs are doing much better than before we started disinfecting the water. By going on stocking density and food consumed alone there is a marked difference.

Since the onset of PMWS vice had become a major problem especially tail and flank biting. Obviously this puts a great stress on the pig involved and it would go down very quickly with PMWS even though we pulled it out into a sick pen with low stocking density.

This year even though we have had a lot of changeable weather, which doesn't suit our ACNV buildings, our problems with tail biting is as low as it was pre PMWS.

Having done all our structural and feeding changes last year the only difference this year has been a changing of the pneumonia vaccine, from injection of the piglet to the injection of the sow and the introduction of the water treatment / terminal disinfection formulations. I believe the improvement in water quality and flow rate through the nipples has been a major contributing factor to the reduction in tail biting which has seen a marked reduction in our mortality from PMWS.

Our PMWS has not gone away but the use of a superior disinfectant and treatment of the water has been a major step to allowing us to make big improvements. Having tried changing a lot of different things in the early days of PMWS and seeing some improvement, it was always extremely variable especially from one batch to the next.

We have now managed consistent improvements, which has resulted in a return to far more even pigs within batches and far less pigs being removed to sick pens, where they would probably have wasted away and died.”

David Wilkinson, the farm owner commented:

“The formulation is a very good aid to combating PMWS in conjunction with other protocols. It is not a cure. We feel that it has an important part to play in the fight against the disease.

Post weaning mortality has fallen significantly since the introduction of these two new protocols and we hope to see further improvement as its use increases around the unit

Batches of pigs are more uniform and a better growth rate is seen.”

The formulation has a lot to recommend it.

CONCLUSIONS

1. While AGWA Clean is an effective terminal disinfectant, its major success at Pilmoor Grange and other farms is attributable to its unique water system cleaning properties. The real issue is biofilm, which harbours many potentially dangerous organisms that can enter the water system. As water is the main input to any pig unit the importance of treating water systems to remove this very real threat cannot be over emphasised.
2. Drinking water represents a considerable external input to an intensive breeding situation. Although water can carry a wide spectrum of microorganisms, many of which are harmful, few farms pay much attention to their water supply systems.
3. Water treatment at Pilmoor Grange has improved the quality and quantity of water supply. The farm has confirmed the benefits with regard to improved food intake, consistent weight gain, reduced vice and reduced mortality.

AGWA Clean completely sanitises farm water supplies. This, combined with a superior, longer lasting disinfectant, has resulted in the creation of a “simple to use” on farm system giving an outstanding efficacy of bug kill. Together with its environmental and user friendliness, it has demonstrated its effectiveness as a weapon of modern bio-assurance.

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