Suitability of litter amendments for the Australian chicken meat industry
Litter amendments are products that change the chemical, physical or biological properties of poultry litter, and can be added to litter in meat chicken houses to reduce ammonia production and viral/bacterial presence. Litter amendments may also increase the nutrient value of spent litter, which is often on-sold as products such as fertiliser or can be reused for the next batch of chickens. Reuse of litter in Australia is not common because the preference is for the use of fresh bedding such as wood shavings or straw, but there is currently considerable pressure on the supply of fresh bedding material for meat chickens. Despite perceptions, reuse of litter can be beneficial for the new batch of chickens because it is warmer and more insulating than some bedding materials, and helps to establish healthy gut bacteria. However, it’s important that reused litter is appropriately managed to reduce risks relating primarily to ammonia production and pathogen loads. To reduce these risks, the chicken meat industry may need to consider the use of litter amendments in the future. The project involved a literature review and industry consultation on the use of litter amendments. The purpose of consultation was to understand industry views on litter reuse and potential future role of litter reuse and amendments.

Summary

Litter is the material used on the floor in meat chicken houses. At the start of a grow-out, it can either be fresh bedding materials, such as wood shavings, straw or rice hulls, or litter that is reused from the previous grow-out. Reused litter contains manure as well as the original bedding material. Reused litter can have beneficial properties, such as increased warmth during brooding and better cushioning and insulation. It is also rich in nutrients and microflora from the previous flock, which can help to establish healthy gut bacteria, but nitrogen in the litter contributes to ammonia production. Litter amendments are used to reduce ammonia production and viral/bacterial presence when the litter is reused for multiple grow-outs. Litter amendments may also increase the nutrient content of the litter and simultaneously reduce the potential for nutrient runoff when spent litter is used as an agricultural fertiliser. To reduce potential risks of ammonia exposure and diseases, reused litter must be managed appropriately. As a result, the chicken meat industry prefers to invest in fresh litter.

Key findings

There are low rates of litter reuse in Australia. Litter amendments are not routinely used in Australia (primarily due to low levels of litter reuse and virtually no brooding on reused litter). The most popular amendments used overseas are acidifying agents. The industry has numerous concerns about litter reuse – ammonia, disease and pathogen carryover, odour, additional labour requirements, and inadequate time for litter treatment processes to be completed effectively because of quick turn-around times between flocks. Industry concerns about litter reuse outweigh the potential benefits – cost effectiveness and warmer, drier and better-insulating litter. Litter reuse practices and use of litter amendments are likely in the future due to forecast shortages in fresh bedding supplies.

Implications

While litter reuse is not commonly practiced, there is general agreement that it would likely need to become standard practice in Australia. Therefore, to support industry transition to litter reuse practices, there is a need for better understanding of litter amendments, including detailed cost-benefit analysis of litter reuse coupled with litter amendment use.

The most popular litter amendments are acidifying agents

Review of the literature found that the most popular amendments (based on overseas experiences) are acidifying agents that reliably reduce ammonia concentrations in the shed, and microbial presence in litter. Reported effects on performance, health and welfare are generally positive. Other types of litter amendments have been evaluated with demonstrable effects, but are less widely used by meat chicken farmers overseas.

Generally low rates of litter reuse in Australia

A questionnaire was completed by 11 industry stakeholders, including veterinarians, farming managers, service people, litter contractors or poultry consultants who support the six major chicken meat companies in Australia. The questionnaire covered eight broad areas, including past, current and likely future use of litter reuse and amendments; understanding of litter amendments and their effects; knowledge gaps; and possible practice change as a result of quality information.

The responses revealed low rates of litter reuse due to a preference for full litter clean-out at the end of each batch of chickens. While respondents commented that new bedding materials were becoming more difficult and expensive to source, it did not result in uptake of litter reuse in most regions. Some farms have reused litter in response to shortages of new bedding supplies, but even they implement only partial litter reuse practices (placing new bedding in the brooding section for chickens up to one week old, and placing only reused litter in the non-brooding section of the shed). When litter is reused in Australia, it is generally pasteurised by heaping or windrowing. This is effective at reducing pathogen load, but less so at reducing ammonia production during brooding. It is also time consuming to implement properly. There is a need to better understand how the use of litter amendments might be effective for supporting litter reuse practices in Australia.

Industry concerns for litter reuse outweighed the potential benefits

The main concerns about litter reuse were ammonia, disease and pathogen carryover, odour, additional labour requirements, and inadequate time for litter treatment processes to be completed effectively because of quick turn-around between flocks. These concerns appear to have outweighed the potential benefits reported by those who reuse litter, which included cost-effectiveness and having warmer, drier and better-insulating litter. Because the use of litter amendments is tightly linked to litter reuse, it is not surprising that with very limited litter reuse, and effectively no brooding on reused litter at all, there is currently no routine use of litter amendments in Australia.

Litter reuse practices and use of litter amendments are likely in the future

Most respondents indicated that adopting litter reuse practices and using litter amendments were likely in the future due to challenges with sourcing new bedding, rising costs, and other problems with selling or disposing of spent litter. It was, therefore, not surprising that there is no readily available supply of litter amendments proven to be effective under Australian conditions. To support industry uptake, sound scientific evidence, proof of cost effectiveness, and suitability for Australian chicken meat production practices are necessary.
Recommendations

Increased uptake of litter reuse and use of litter amendments may need to be considered in some meat chicken growing regions where supplies of fresh bedding materials are limited or not cost effective. It is recommended that the information compiled in the project be made available to the chicken meat industry to support uptake if it’s required.

Although some locally sourced amendments have been trialled over the years, widespread uptake has not followed. Further, litter amendments widely used overseas are not readily available here and have not been trialled under Australian conditions (temperatures, litter types, feed and energy costs). More research is needed to identify the most appropriate litter amendments and determine the best practice options for their use.

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Dr Mark Dunlop  
Department of Agriculture and Fisheries,  
Queensland Government  
PO Box 102, Toowoomba Q 4350  
07 4529 4280  
mark.dunlop@daf.qld.gov.au  

Professor Stephen Walkden-Brown  
University of New England  
Animal Science W49, UNE, Armidale, NSW 2351  
02 6773 5152  
swalkden@une.edu.au  

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