Submission regarding Environmental Standard: composting, Division 3 Part V Environmental Protection Act 1986 (WA)

Thank you for providing the Australian poultry industry with the opportunity to comment on the draft Environmental Standard: composting, Division 3 Part V Environmental Protection Act 1986 (Standard).

Introduction: Overview of Australian poultry industry
In Australia, the term “commercial poultry industry” spans a number of industries based on different types of birds. These include, predominantly, chickens, then turkeys and ducks, followed by geese, with game birds (including quail, pheasant, and pigeon) and specialty birds (including ostrich and emu) rounding out the species.1 In this Submission we will discuss the chicken industries as they produce the greatest quantity of by-products for composting.

Chicken meat is easily the most substantial poultry industry. To put this into perspective, Australian chicken meat consumption is estimated to have reached 45.2 kilograms per person per year by 2014-15.2 Australians eat more chicken meat than beef, lamb and mutton combined.3

Many consumers fail to grasp the scale of Australian chicken meat production because it is undertaken by a small number of quite large, vertically integrated, privately owned enterprises. The two market leaders are Baiada Poultry (Baiada) and Inghams Enterprises (Inghams) holding between them, roughly 70% market share nationally. These two companies produce the vast majority of chicken meat in WA. These vertically integrated companies typically own hatcheries, feed mills, breeding farms and processing plants. The companies usually contract out the growing of their meat chickens to independent contract chicken growers, of which there are approximately 800 nationally. The Australian chicken meat industry is relatively mature, and has a history of rapid adoption of new technology. This has allowed the industry to achieve significant productivity improvements over the past fifty years.4

The egg industry, on the other hand, is composed of farmers running cage, barn and free-range operations, with a range of farm sizes, flock sizes and stocking densities. Vertical integration, giving rise to four major privately owned egg production companies, has been partly offset by the rise of small to medium free-range farms across Australia, resulting in a moderately integrated industry sector with the majors taking just under 60% of industry revenue in 2014-15. In Western Australia, AAA Egg Company Pty Ltd is the largest commercial egg producer.

**By-product streams: spent litter and manure**

The excreta by-product streams of the chicken meat and egg industries differ both between the industries, and within the egg industry.

Meat chickens are usually housed in sheds on bedding or litter made of wood shavings, sawdust, rice hulls, chopped straw, or shredded paper. During the grow-out of a batch of chickens (between 35 and 60 days), the birds' droppings are added to this bedding material. After one or a number of batches of birds have been raised, the litter is removed from the shed and is said to be *spent*, hence the term, spent litter.

For laying hens (layers) housed in cage production systems without litter, the by-product mixture includes mostly excreta, some undigested feed, and a few stray feathers. For layers housed in free-range and barn systems, litter is often used but, unlike meat chickens, the layers may live on the litter for up to 12 months.

To avoid confusion, this Submission will use the term “spent litter” for the by-product of chicken meat production and “layer manure” to describe the by-product from all types of egg production systems. Layer manure may, however, range in composition from an almost pure excreta material to a litter-based one similar to spent litter (although generally more aged).

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Disposal of spent litter and layer manure

Given the useful nutrients and trace minerals in spent litter, it may be used for applications including as crop fertiliser or soil conditioner.10 There are limits to the distances spent litter may be transported for these kinds of applications, owing to the bulk of spent litter, which makes it a viable fertilizer source only for users located relatively nearby chicken farms.11 Layer manure, on the other hand, has relatively high moisture levels (31 – 73.7%12), reducing the distances it may be transported due to weight. Thus there are occasions where it is preferable to compost spent litter and layer manure rather than attempt to transport them uncomposted.

Other wastes

In addition to spent litter and layer manure, chicken meat farms also experience a low percentage of mortalities during batch (3-5%)13 and these carcasses must be disposed of, with one method of disposal being composting. Layer farms, on the other hand, must periodically depopulate their flocks when the hens cease to lay eggs at around 72 weeks of age.14 These “spent hens” were "historically ... transported to poultry processing plants ... for use in a variety of human food products".15 Some egg producers now practice on-farm euthanasia of spent hens for a number of reasons16 and some of those farmers use composting to dispose of the 20 to 100MT of carcasses.17

Impact of the Standard

For large-scale chicken meat and layer farms, composting of significant quantities of spent litter and layer manure, respectively, may bring them within the purview of the Standard. Even when not quite at these levels, spent litter and layer manure may be, or be part of, feedstock provided to composting facilities.

Necessity of composting

Given the above, the WA poultry industry therefore takes a keen interest in ensuring the continuation of composting of spent litter and layer manure. For this reason, we make the following comments in this Submission regarding the Standard.

11 Ibid.
14 Dr Peter Scott, Development and Extension of Industry Best Practice for On-Farm Euthanasia of Spent Layer Hens (Poultry CRC, May 2015) 1.
15 Ibid.
16 Ibid 10–11.
The Standard

6 Operating methods

Unacceptable feedstock, Clause 6.1
Pursuant to Clause 6, unacceptable feedstock must not be accepted at composting facilities. Sub-Clause 6.1 states that "hazardous wastes" are unacceptable feedstock and defines hazardous wastes to include any "waste which by its characteristics poses a threat or risk to public health, safety or the environment (includes substances which are ... infectious)".

Since Clause 1 Purpose states that the "ES sets out the minimum standards that apply to composting facilities" (our emphasis), we assume the ES will be applied strictly. If so, Clause 6 would classify spent litter and layer manure as "unacceptable feedstock", given that they will, in most cases, contain bacterial agents such as Salmonella spp. when in their raw form.

As one of the primary benefits of composting is pasteurisation leading to the elimination of bacteria and the inactivation of viruses, why would a Composting Standard be drafted to permit an interpretation which would exclude these feedstocks from composting facilities?

We submit that the Clause should be re-drafted to prevent spent litter and layer manure from potentially being classified as "hazardous wastes" that must not be accepted at composting facilities.

Contaminants in waste feedstock, Clause 6.2
The term "contaminants" is not defined in Clause 6.2.

How the term could be interpreted in a legislative context is open to a number of approaches, from "any substance, the presence of which may be harmful to safety or health"\(^{18}\) to the definition in Section 7 of the Biosecurity and Agriculture Management Act 2007 (WA), being:

"7. Meaning of "contaminated"

For the purposes of this Act an animal, agricultural product, animal feed, fertiliser or other substance or thing is contaminated if —

(a) it contains more of a chemical product or other substance than the maximum residue limit of that chemical product or other substance prescribed in relation to that animal, agricultural product, animal feed, fertiliser or other substance or thing; or

(b) it contains such an amount of a chemical product or other substance that ordinary use of the animal, agricultural product, animal feed, fertiliser or other substance or thing is likely to result, directly or indirectly, in the presence of more than the maximum

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\(^{18}\) Occupational Safety and Health Regulations 1996 (WA) Reg 3.82.
residue limit of that chemical product or other substance in another animal, agricultural product, animal feed, fertiliser or other substance or thing; or

(c) it contains a substance or thing, other than a substance or thing in relation to which a maximum residue limit is prescribed, in the circumstances prescribed in relation to that substance or thing; or

(d) the regulations prescribe circumstances in which an animal, agricultural product, animal feed, fertiliser or other substance or thing is contaminated, and those circumstances occur in relation to the animal, agricultural product, animal feed, fertiliser or other substance or thing."

We regard the approach used in the Biosecurity and Agriculture Management Act 2007 (WA) as appropriate for animal wastes which will ultimately be used as manures or fertilisers, provided the maximum amounts of residue limits of chemicals, bacterial or viral agents is set to a realistic level.

We therefore submit that a definition along these lines be added for "contaminants".

Composting method, Clause 6.4
Table 5 Required composting method based on feedstock risk category and the notes relating to the Table present severe problems for large scale open air composting of mortalities, such as mass composting of carcasses of spent layer hens, particularly on-farm. Windrows must be able to be turned, otherwise the required complete pasteurisation for the killing of bacteria and the inactivation of viruses cannot occur throughout the windrow. It is simply not practical to undertake these activities in-shed and, even if it were practical, presumably the opening of shed doors for machine access for windrow turning may convert the shed into an "open environment". This part of the Environmental Standard requires significant rethinking to avoid large numbers of carcasses going into landfill sites.

While we recognise that the requirements of Table 5 potentially only applies to the largest poultry farms, including AAA Egg Company Pty Ltd and some of the chicken meat industry's larger grower farms, owing to the concentration of the poultry industry, these account for a considerable part of total production in WA.

We submit that Clause 6.4 of the Standard requires extensive reconsideration and redrafting to make it workable and, indeed, achievable for the poultry industry.
Pathogen and contaminant limits. Clause 7.2
Clause 7 of the Standard sets out the standards that products from composting facilities must meet in order to not be considered as waste. Under Clause 7.2, Table 6 lays out pathogen limits, while Table 7 describes chemical and physical contaminant limits.

Pathogen limits
It is now very well established that spent litter, when pasteurised to 55°C for at least three days results in an efficient killing of pathogens, and heating to 60°C for thirty minutes may be a superior method of ensuring pathogen killing. Therefore even partial composting (including by windrowing or heaping) of spent litter is therefore quite adequate to reduce pathogen levels to acceptable levels. While we note the ‘pathogen limits’ set out in Table 6, we understand this is not a global best practice approach. What is required is ensuring that the process itself is followed strictly as there will always be a range of pathogen levels depending on factors including the type of feedstock, the season, and the species or type of bird by-product being composted.

We submit that the best practice approach should be used in place of arbitrary limits.

Contaminants
For the listed contaminants in Table 7, all allowable limits, except for Zinc (300 mg/kg dry weight), are below the amounts measured in spent litter, turkey litter and layer manure. For Zinc, all of these sources exceed the maximum allowable limit set out in Table 7, with measurements of mean mg/kg for Zinc at 353 (spent litter, 1997), 361 (spent litter, 2010) 340 (turkey litter, 2010) and 350, (layer manure, 2010). Other studies have indicated that Zinc levels in layer manure may reach 540 mg/kg. This means, of course, that if the Standard is applied, products derived from spent litter, turkey litter and layer manure would be “waste”, despite them otherwise being completely within the description of the product categories set out in Sub-Clause 7.1. This is, indeed, an odd situation for a class of products routinely sold to consumers and used in broad acre farming.

Zinc is usually considered as a plant “micro nutrient”, along with iron, magnesium, boron, copper, manganese and molybdenum. While excess amounts of Zinc may certainly be considered as a contaminant, the concentration limits for compost, soil conditioners and mulches for land applications have been set out by NRMCC (2004), NSW EPA (1997) and VIC EPA (2004) in mg/kg.

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19 See, for example, the introductory comments in H N Chinivasagam, Re-use of chicken litter across meat chicken batches – managing the food-borne pathogen risk, Final Report (Australian Poultry CRC, 2008) 2.
20 Ibid.
22 N W Griffiths, Poultry litter is not all the same (NSW Department of Primary Industries, Tocal Agricultural Centre, Paterson NSW 2421, 2015).
24 Ibid.
greatly exceed 300 mg/kg, at 2500, 3500 and 2500, respectively.\textsuperscript{25} Having said this, “nutrient levels can vary by 100% or more between litter sources and batches”\textsuperscript{26}, it therefore makes good farming practice and commercial sense to “establish a baseline for soil nutrients before undertaking a long term chicken litter application program.”\textsuperscript{27}

We submit that the limit for Zinc in Table 7, should be raised to at least 3500 mg/kg on a dry weight basis.

Conclusion

Again, thank you for the opportunity to comment on the Standard. Our industry believes that, if applied strictly, the Standard would prevent composting of spent litter, layer manure and large scale on-farm composting of mortalities and spent hens. The environmental cost of ceasing composting and using some other method of disposal, such as land fill, for these by-products of the chicken meat and layer industries is incomprehensible, while the economic cost to producers would be significant. We therefore strongly recommend that the Standard be extensively revised to bring it closer to the workable approaches employed in the New South Wales’ Department of Environment and Conservation Environmental guidelines: Composting and related organics processing facilities (2004) and Victoria’s Environment Protection Authority Guideline: Designing, construction and operating composting facilities (2015).

\textsuperscript{25} ibid.
\textsuperscript{26} See, for example, Rural Directions Pty Ltd, Chicken Litter as Fertiliser for Broadacre Grain Crops a user’s guide (2012) Rural Directions Pty Ltd. <http://www.ruraldirections.com/media/Documents%202013/Chicken%20Litter%20Users%20Guide%20V4.pdf>
\textsuperscript{27} ibid 6.