Development of a 'separation distance' calculation that can be used for egg farm planning in Australia

This project developed an 'S-factor formula' which is a calculation that can be used to estimate the separation distance that will limit the potential impact on the community (such as noise and odour) from proposed new and expanding layer farms. It is recommended that this formula be integrated into the Environmental Guidelines for the Egg Industry, that are currently undergoing review, as a first step for assessing new and expanding farms, before going to detailed, expensive and sometimes unnecessary odour impact assessment using odour modelling.

Key Findings:

- From the review of the Environmental Guidelines for the Egg Industry a key knowledge gap was the lack of a separation distance formula for assessing the likely community impacts, particularly due to odour, for new and expanding layer farms.
- Formulas developed for the meat chicken industry produce a very conservative estimate for layers, as the odour emission rate per bird for meat chickens is significantly higher than for layers.
- Factors that can impact on the recommended separation distances include the number of hens, the design and management features of the farm, the surface roughness of the earth between the poultry farm and neighbours, local terrain surrounding the farm and site meteorological conditions.
- Using existing data and a similar approach to that used for the Australian pork, cattle feedlot and meat chicken industries, an S-factor formula specifically for the layer industry was developed:

  Separation Distance = (Number of birds/1000) 0.63 x S1 x S2 x S3 x S4 (Optional)

  Where:

  S1 *– Sensitive land use factor for estimating the relative odour impact potential of a development.*

  S2 *– Land surface roughness factor for estimating the potential changes to odour dispersion due to changes in the roughness of the land surface.*

  S3 *– Terrain weighting factor for estimating the potential changes to odour dispersion in situations where meteorological conditions may be influenced by local terrain features.*

  S4 *(Optional) – Wind frequency factor for estimating the relative odour impact due to the frequency of wind direction for wind speeds less than 3 m/s.*

- The predicted separation distance for several theoretical farms was compared to various odour modelling and odour impact criteria which showed that the above formula produced more conservative (greater) separation distances than some of these criteria, but was not able to provide conservative separation distances when compared to the very stringent criteria adopted in some states, particularly South Australia and Victoria.

Implications

The use of this formula will improve planning and development outcomes for the egg industry.

Further information

Researcher: Eugene McGahan; Integrity Ag Services; eugene.mcgahan@integrityag.net.au
Australian Eggs: Gemma Wyburn; Sustainability Coordinator; gemma.wyburn@australianeggs.org.au