Epidemiology of orf in sheep flocks across England

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Implications

- Orf is endemic both to England and other parts of the world, affecting sheep production. The disease has health and welfare limiting consequences with a huge economic burden to the English sheep farming industry.
- Research has shown that up to 30% of people in the farming community may contact orf during their life time which may result in absence from work and in worst cases may result in hospitalisation.

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Introduction

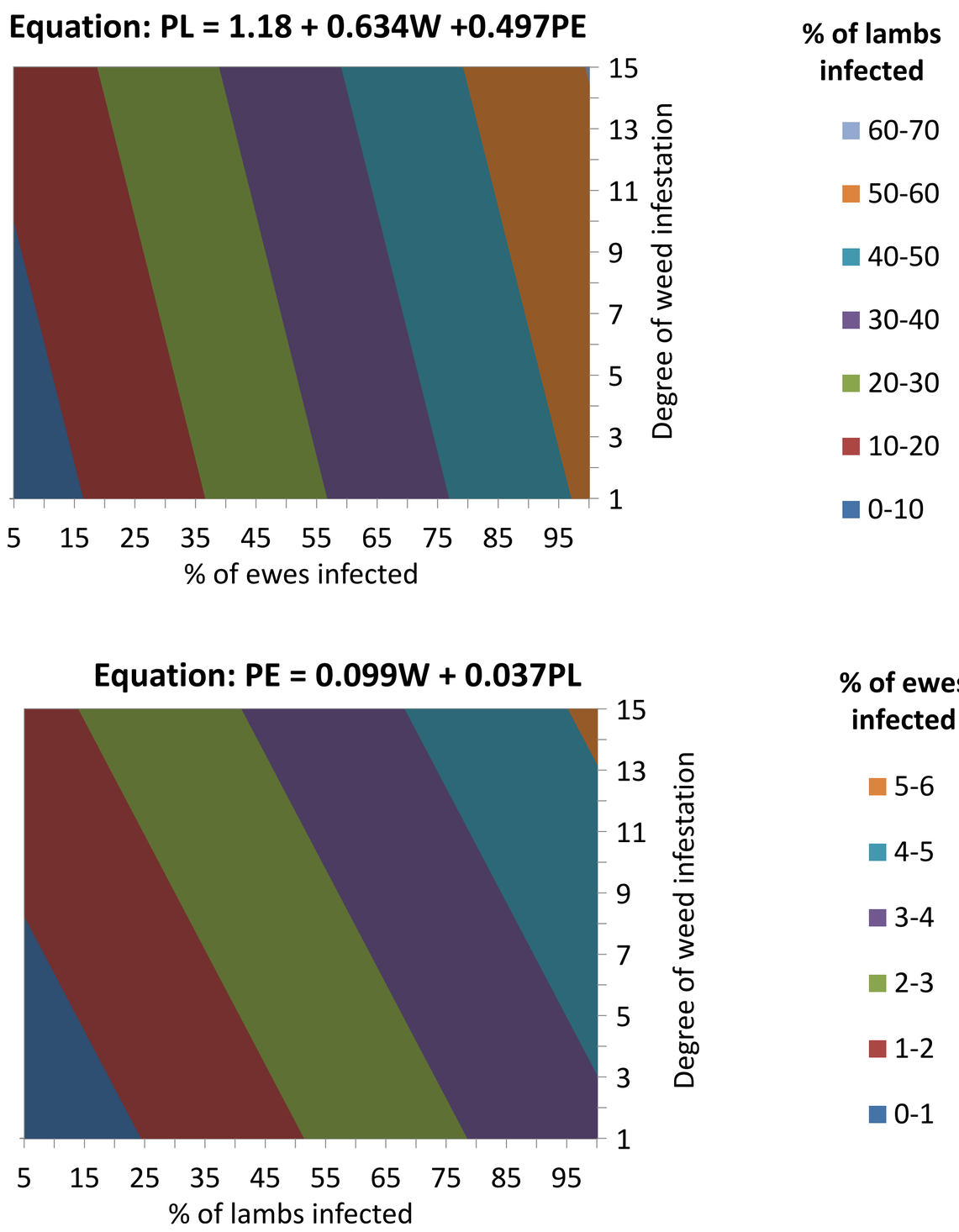
- Orf is a common viral disease of sheep in England which causes economic losses (Lovett *et al*., 2012). The disease is caused by an epitheliotropic (has affinity for the skin) parapoxvirus of the family poxviridae (Hosamani *et al*., 2009).
- Most studies have looked into virology (Billinis *et al*., 2012) while those focusing on epidemiological aspects in English sheep farms are very limited.
- It was therefore the aim of this study to investigate 1) the prevalence of orf 2) vaccination efficacy 3) potential risk factors for orf across England

Material and methods

- 3000 farms, registered with the English Beef and Lamb Executive (EBLEX) were targeted for collection of data by survey with 762 complete responses received.
- The following variables were included: number of ewes and lambs; biosecurity measures; presence of weeds (thistle, nettles, docks and ragwort); lambing start and end month; lambing management (indoors, outdoors); presence of orphan lambs and orf prevalence (%); vaccination of ewes and / or lambs, month of vaccination; percentage of lambs and ewes in the flock affected with orf; numbers of new stock and type of farming.
- Number of animals was used to calculate stocking rates; the degree of weed infestation on the farm (with ratings of 0 to 5 used for nettles, thistle, docks and ragwort) was used to derive an overall rate for weeds (0 to 15), with ragwort being discarded as preliminary analysis found it was not a significant risk factor; lambing start and end month was used to create the variable lambing season (warm for month 6 to 9 and cool for the others), and lambing season duration; the other variables were left as originally collected.
- Analysis was conducted using both regression and generalised linear models routine and employed both IBM® SPSS® Statistics 21 software.

Results

- Disease relative risk (RR) was 2.04 for ewes and 0.75 for lambs, and therefore the vaccine is effective in the control of the disease when given to lambs (RR < 1) but not when given to ewes (RR > 1).
- Multivariate regression analysis demonstrated that disease prevalence in lambs and in ewes (F = 20.59, 2, $P < 0.001$) and ewes (F = 29.15, 2, $P < 0.001$) was influenced by degree of weed infestation.
- Risk factors associated with orf were weeds (thistle, nettles, docks and ragwort), orphan lambs and long lambing season.



Conclusion

- Weed infestation, long lambing season and high numbers of orphan lambs were identified as risk factors for orf in this study.
- From the findings it can be concluded that the prevalence of orf in both ewes and lambs affect each other, though the impact is higher in lambs with increased prevalence in ewes.
- A short lambing season lowers the probability of a farm experiencing cases of orf since tasks such as vaccination can all be concentrated within a short time.
- Vaccination is effective in lambs but not necessarily in ewes, even though, lambs benefit when ewes are vaccinated. Vaccination should be prioritised in lambs especially when there is vaccine shortage.

References:

Abu Elzein, E. M. E. & Housawi, F. M. T. (2009). Drastic cutaneous multi-focal orf infection in goats, causing severe dysfunctioning. *Rev. sci. tech. Off. int. Epiz.* **28** (3) 1025-1029.

Lovett *et al*., (2012). Case-control study of orf in pre-weaned lambs and an assessment of the financial impact of the disease. *Veterinary Record 1**70**: 26 -73.*

McElroy, M. C., & Basset, H. F. (2007). The development of oral lesions in lambs naturally infected with orf virus. *Veterinary Journal* **174** (3) 663 – 664.

Woodwart, W. (2005) *Epidemiology: Study design and data analysis*, 2nd ed. Chapman & Hall / CRC: Boca Raton, Florida, USA.

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