Unfriendly feathers?

Negligible risk from Asian countries with highly pathogenic avian influenza.

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Concerns have been raised that manufactured goods such as pillows, sleeping bags and duvets containing feathers from Asian countries may pose a risk of introducing avian influenza. Howard Pharo, Biosecurity New Zealand's Team Manager Risk Analysis (Animal Kingdom) with Biosecurity New Zealand's Pre-clearance Directorate, analyses the risk.

The commodities of concern include anything made from processed feather and down, such as pillows, jackets, sleeping bags or duvets. The hazard in this case is highly pathogenic avian influenza (HPAI) viruses of all types.

Survival of the virus

Because avian influenza infections affect the intestines, large quantities of virus are excreted in faeces of infected birds. Ducks have been shown to excrete the virus for as long as 30 days (Easterday et al, 1997).

Type A influenza viruses are relatively easily inactivated under a range of environmental conditions and routine cleaning. Influenza A viruses are very prone to physical and chemical change, and because of the lipid (i.e. composed of fats or oils) envelope, detergents and most disinfectants quickly destroy infectivity (Slemons and Brugh, 1994). Under normal environmental conditions infectivity is lost relatively quickly – for example after 7 days at 20 ^{o}C (Manville et al, 1996), and after 2 days at 25°C in the case of the 1997 Hong Kong H5N1 virus (Shortridge et al, 1998).

However, survival of HPAI viruses in the environment is increased in cool and moist conditions. For example, the viruses have been found up to 105 days after depopulation following an outbreak of HPAI (Easterday et al, 1997), and infectivity in faecal material has been retained for 30-35 days at 4 ^{o}C (Manville et al, 1996).

Effect of processing

Pasteurisation temperatures (i.e. 63 ^{o}C) can significantly reduce the concentration of viable influenza virus. The final level depends on how much virus was present before treatment and how long heating was applied (Swayne, unpublished data, 2004).

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Since most transmission is by the faecal-oral route, transmission of avian influenza between poultry farms via objects such as feathers is highly likely (Pirtle & Beran, 1991). Thus, since avian influenza virus have been reported in a wide range of avian species, and since transmission of influenza viruses is predominantly by the faecal-oral route, it is possible that feathers of various avian species could harbour avian influenza viruses. Indeed, the draft OIE code recommends specific safeguards (treatment for destruction of the virus) where feather meal is to be used in animal feeds.

Standard processes used in the feather and down industry would ensure that the likelihood of any viable avian influenza virus being present on these products prior to their use in manufacturing is negligible. Feathers contaminated grossly by faeces are unsuitable for manufacturing because of their smell and their tendency to decompose. Such feathers would probably either be discarded or washed and dried prior to use. Washing the feathers in warm water using a non-ionic detergent would quickly destroy the infectivity of any avian influenza virus present.

While production processes used in the feather and down industry vary, typical procedures for washing, drying and separating feathers and down would effectively kill any virus that was present.

Therefore, the likelihood of viable avian influenza virus being present in feathers and down prepared for manufacturing products such as pillows, jackets, sleeping bags or duvets would be negligible.

Risk of exposure

It is very unlikely that susceptible avian species in New Zealand would be directly exposed to feathers and down in products such as pillows, jackets, sleeping bags or duvets.

Conclusion

The likelihood of viable avian influenza virus being present in these commodities is negligible, and the likelihood of the feathers in these products coming into contact with susceptible avian species in New Zealand is also negligible. Therefore the risk of introduction of avian influenza viruses via this pathway is assessed as negligible.

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