In the poultry industry, as the hens near the end of their productive lives, they are of little economic value to the farmers and seen as a by-product or waste. One way to add value to spent hen products is to produce adhesives from their protein. Adhesive bonding of wood plays an increasing role in the forest products industry and is a key factor for efficiently utilizing our timber resource. Concerns over emissions have created the necessity for the industry to investigate new alternatives to petroleum-derived, synthetic adhesives.

### Summary

A spent-hen is seen as a by-product or waste of the poultry industry which requires disposal.

### Summary Problem

A spent-hen is seen as a by-product or waste of the poultry industry which requires disposal.

### Our Approach

This study reveals that agricultural waste and by-products can be used to create water-resistant wood adhesives through the modification of their proteins. The protein-based adhesive has compatible properties with the commercial wood adhesives, such as urea formaldehyde (UF) or phenol formaldehyde (PF).

### Our Observation

Protein-based adhesive was successfully developed with improved performance, both in shear strength and water resistance. Spent hen proteins are superior to soy proteins in preparing adhesive. Advantages – long shelf life, free of formaldehyde, cost-saving in long-distance transportation. Can be mixed with curing, modifier and water, and applied to laminate. It can also be mixed with wood fiber/flour to make wood/bio-plastic composite.

### Acknowledgements

We would like to thank Alberta Livestock Meat Agency (ALMA) and Alberta Innovates - Biosolutions for financially supporting this work.

### Contact Information

Author: adhesive@ualberta, 1-(780)-716-5755  
Corresponding Author: Jianping.Wu@ales.ualberta.ca, 1-(780)-492-6885