

The Frequency of the *PRKAG3* Mutation (*RN-*) in the Commercial Pig Population and its Costs to Ham Production

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The *RN-* mutation causes a ~70% increase in muscle glycogen which results in a lower ultimate pH, paler colour and a 10% increase in cooking loss. The estimated lost revenue caused by the dominantly inherited gene is ~\$12.00 per pig processed for ham products. In a previously reported limited random survey, the *RN-* biochemical phenotype was found in ~25% of retailed pork chops and 79% of the *RN-* samples were from phenotypically white coat pigs. It was also found that *RN-* type pork typically had a 5-fold increase in glucose 2 to 4 days after processing, which makes on-line testing possible. A single genetic mutation (G→A) in a muscle specific regulatory subunit of adenosine monophosphate-activated protein kinase (*PRKAG3*) is believed to be the cause of the *RN-* phenotype. An SSCP and DNA sequencing test has been developed at Lacombe to screen for this genetic mutation. Initial surveys have found that the *PRKAG3* mutation can predict ~95% of pork products containing excessively high glycogen.

Implications: It is recommended that the *PRKAG3* mutation be removed from commercial breeding stock to insure the quality of Canadian ham and fresh pork products.