Graham Plastow: Livestock and the Promise of Genomics

Genomics' promise has already delivered tangible results for Canadians, but the greatest gains have yet to be realized.

Canadian genomics research has helped provide the world with the 50,000 (50K) SNP panel chip for cattle breeding, and identified the gene responsible for porcine stress syndrome (PSS), a disease that results in increased swine mortality and reduced pork quality.

The 50K SNP panel is viewed as a significant advancement by the world's dairy industry. Through the use of this genomics-based test, the dairy industry is capable of improving productivity by 50 percent, the largest gain since the early 1960s when herdmate comparison was developed. These are the sort of gains required to maintain food security against increasing demand with fewer resources such as land, water, and energy as well as the impact of climate change.

Canada has shown it can lead the world and own its own research in the livestock sector. For example, pigs with the PSS gene, when not showing greater morbidity and mortality levels, are prone to producing soft pale exudative pork. The Canadian DNA test that was developed to identify the PSS gene, and its elimination form the national herd, saves the Canadian industry more than $5 million annually. On a global scale, hundreds of millions of dollars have been saved with subsequent improvement of animal health and welfare.

With an expected population of nearly 9.2 billion people by 2050, the equivalent of adding a new Winnipeg every 3.2 days, the world will need a great number of research advances such as these if it is to feed itself. Furthermore, the movement of nearly 3 billion people into the middle class in countries such as India, China, and Brazil, will result in an unprecedented demand for meat protein. However, not all of the protein that the world is going to need will be produced near its concentrated consumption regions, such as China and India.

In the next 50 years the planet will need to double the amount of food it produces today against the challenges set out above. As a nation that produces high quality food from its abundant resources including land and water, this represents a unique opportunity for Canada. This is reflected in a unique "Canada Brand", an international representation of Canadian food and agricultural products, such as pork, that are regarded as fresh, environmentally friendly, finest quality, and cultivated by a dynamic sector of competent, trustworthy, and reliable professionals. Furthermore, Canadian technology and export networks are state-of-the art, with industry leaders and researchers being among the most dynamic and skilled experts in translating complex science to commercial deliverables.

Ultimately, Canada's environment is seen around the world as relatively unharmed by human development, it's agriculture as renewable, and its food production potential not fully exploited. Canada has an opportunity to compound the economic benefits of these reputations ….. **Healthy** animals, making **Healthy** protein, making **Healthy** people.

Canadian research has helped to dramatically shrink the environmental footprint of poultry and pigs over the past decade, further expanding this nation's potential for production expansion.

Canada is capable of driving the livestock agenda worldwide by developing and enhancing traceability, calibration, validation and demonstration of genomics technology and growing the efficiency of food production through research and development.

Genomic tools can create the ability to track and trace the national and global animal protein and ensure its safety and sustainability.

With its depth of talent, research capacity and reputation for healthy and sustainable production, Canada should own this research and be home to the most profitable animal agriculture and related technologies in the **world**.

Nationally Canada's agricultural industries have learned to work together within their sectors, despite being natural competitors. For example, cattle breed organizations work together to improve research that will benefit all beef and dairy producers.

The benefits of research have improved returns for industry and reduced the demands on the nation's resources. A five percent improvement in feed efficiency in beef cattle production can save $300 million over a decade, making better use of feed and land resources. Similar improvements in carcass quality can yield much more and aid Canada in growing its industry and allowing for the development of value added processing that could be further leveraged by the Canadian reputation.

Funding for genomics research that will put the tools of increased production in the hands of industry needs to step beyond projects and into a program/policy phase that will ensure long term benefits for the Canadian industry.