BoarHub: a data sharing platform for boar semen quality and sow fertility

Executive Summary

Artificial insemination (AI) centres have played a major role in the Canadian swine industry for several decades. More than boar semen distributors and genetic improvement disseminators, they also generate and manage a lot of valuable data on a daily basis. Their customers (commercial pig barns) also collect more and more detailed information about sow fertility and productivity, but very little information is shared routinely. The proposed project aims at creating a data sharing platform (BoarHub) for boar semen quality and sow fertility/productivity. The Canadian swine industry has been a very dynamic agricultural sector, by adopting cutting-edge technology. For instance the early adoption of artificial insemination (AI) in commercial barns was critical to reach high performance levels and maintain excellent health status in pig barns. To remain among the top pork producers and exporters, the Canadian swine industry also needs to seize opportunities offered by novel information technologies in order to lower production costs and remain sustainable.

The proposed project aims at creating tools to share valuable information between AI centres and their customers. By creating feedback channels going both ways, the objective is to improve boar semen quality and enhance sow productivity, using potentially fewer boars than nowadays and enhancing sow productivity. This would lead to savings for both AI centres and commercial producers, better on-farm performance and higher sustainability for the whole sector. Having tools in place to automatically access information about boar semen would also benefit specific sectors of the swine industry such as the breeding sector, providing opportunity for genetic improvement of boar semen quality and early detection of boars carrying specific abnormalities. Other AI centres customers include research facilities managed by universities and research organizations which will have a simplified access to individual boar and semen information useful in applied research projects.

The project will include four main activities:

1. Consultation with stakeholders: specific committees will be formed to define management and technical aspects of the potential data sharing between AI centres and their users. Recommendations will be issued by each committee with regards to which data should be shared, data access policies, tools to be used or developed.
2. Definition of standards: most AI centres use CASA (computer-assisted semen analysis) systems to assess boar semen quality. Pig producers use various on-farm management software packages for their barn information. Standards for data recording and transfer will be developed or adapted, in order to clarify and harmonize semen quality and sow productivity data provided by various sources.
3. Development of the BoarHub platform: most data of interest already exist in local databases. Specific API (application programming interfaces) will be developed to access and share AI and on-farm data. Web tools will be designed to select, visualize and download the available information. Historical data provided by participating AI centres and sow barns will be used for early testing of the platform.
4. BoarHub platform testing: the pilot platform will be tested in collaboration with two large Canadian swine AI centres (*Centre d'insémination porcine du Québec* and Ontario Swine Improvement) and two research farms in Quebec and Ontario. User feedback will be used to fix potential bugs and improve the BoarHub platform so that it could be extended to more swine AI centres and sow barns across Canada.

The project will be led by the Canadian Centre for Swine Improvement (CCSI) in collaboration with the *Centre de développement du porc du Québec* (CDPQ), the *Centre d'insémination porcine du Québec* (CIPQ) and Ontario Swine Improvement (OSI).