The Canadian Centre for Swine Improvement Inc. is a national organization managed by a Board of Directors with representatives from the following member organizations:

CANADIAN PORK COUNCIL

CANADIAN MEAT COUNCIL

CANADIAN SWINE BREEDERS ASSOCIATION

ATLANTIC SWINE CENTRE

CENTRE DE DEVELOPPEMENT DU PORC DU QUEBEC INC.

ONTARIO SWINE IMPROVEMENT INC.

WESTERN SWINE TESTING ASSOCIATION

CCSI's mission is to enhance the ability of the Canadian swine industry to compete domestically and abroad, by providing leadership, coordination and services for swine genetic improvement.

Central Experimental Farm, Building # 54, Maple Drive, Ottawa, Ontario, K1A 0C6
Telephone: (613) 233-8872 - FAX: (613) 233-8903
E-mail: info@ccsi.ca Internet: www.ccsi.ca

Canadian Centre for Swine Improvement Inc.

Annual Report 2003/2004

Table of Contents

1. Message From The Chairman 3

2. Proposed Agenda for June 18, 2004 4

3. Minutes From Last Annual Meeting 5

4. Activity Reports 7

4.1 General Manager's Report 7

4.2 Chief Geneticist's Report 9

4.3 Computer Services Manager's Report 13

5. Appendices 15

Appendix 1. Members of the Board of Directors 16

Appendix 2. People at CCSI 17

Appendix 3. Genetics Committee Members 18

Appendix 4: Genetic change in purebreds and market hogs 19

Appendix 5: Genetic Improvement trends 21

Appendix 6. Home Test Summary For Backfat And Age At 100 Kg 26

Appendix 7. Sow Productivity Summary (2003) 27

Appendix 8: Reports on activities 28

Appendix 9. Breeders Participating In The National Program 29

Atlantic Swine Centre 29
Centre de Développement du Porc du Québec Inc 29
Ontario Swine Improvement 31
Western Swine Testing Association 32

Appendix 10. Participating A.I. Centres 34

1. Message From The Chairman

Another year, 2003/2004, has past and again it was a hard year for hog producers. A low commodity price was the main reason. In last year's message I mentioned that CCSI needed to help the Canadian hog industry to stay globally competitive. Who are we in competition with? Which country? However, when we get into competition there will be winners and losers. In the past years a lot of smaller hog farms and a few bigger ones have disappeared and these we call the losers. How did we get into this competitive cycle that neither proposes nor implies any limits? Is it simply to lower our cost at any price and to gain as much profit at any expense? This competition does not hesitate at the destruction of the family farm and the communities to which they belong. Yet we still compete, hog farmer against hog farmer, buyers of hogs against packing plants, and grain producers against feed buyers, all of us looking for a better way to increase the bottom line.

Now I would like to put forward that we as the board of CCSI are looking for ways to keep the players of the hog industry in the production game. New technologies should help the big farms and also the smaller family farms stay in business and allow them to make a product that is distinctly Canadian. CCSI should also voice these concerns to the Research and Agricultural departments in Colleges and Universities in order to develop the hog industry so that it works together for the good of all the participants and the environment that we are a part of instead of always pushing for the competitive edge.

In the past year CCSI has done well. Brian Sullivan and the other staff have continued to do excellent work. We also had CSBA move into our office and we are doing work for that organization. We hope that in the coming year we work with the same staff and become a bigger player in the industry.

We thank Brian and the staff for their contributions to CCSI in the past year. And I would like to thank my fellow board members and directors for the time spent on the CCSI board.

John Vande Glind
Chairman

2. Proposed Agenda for June 18, 2004

1. Message from Chair

2. Approval of agenda

3. Approval of minutes from last Annual Meeting - June 18, 2003

4. Activity reports

    4.1 General Manager's report
    4.2 Chief Geneticist's report
    4.3 Chief Computer Services' report

5. Presentation and approval of financial report

    5.1 Financial report for year completed March 31, 2004
    5.2 Selection of Auditor

6. CCSI awards.

7. Names of Directors appointed to CCSI's 2004/05 Board.

8. Other business.

3. Minutes From Last Annual Meeting

ANNUAL MEETING OF THE CORPORATION
Arden Park Hotel, Stratford, Ontario
June 18, 2003

Board of Directors 2001/02

André Auger	Canadian Swine Breeders Association
Larry Campbell	Canadian Meat Council
Henry De Wolde	Ontario Swine Improvement
Bernard Dion	Centre de Développement du Porc du Québec
Lloyd Evans	Atlantic Swine Improvement Centre
Pierre Falardeau	Centre de Développement du Porc du Québec
Carl Moore	Canadian Pork Council
Pat O'Meara	Western Swine Testing Association
Adrian Power	Atlantic Swine Improvement Centre
Phil Smith	Ontario Swine Improvement
John Vande Glind	Western Swine Testing Association

Board of Directors 2002/03

André Auger	Canadian Swine Breeders Association
Stanley Boudreau	Canadian Pork Council
Larry Campbell	Canadian Meat Council
Bernard Dion	Centre de Développement du Porc du Québec
Lloyd Evans	Atlantic Swine Improvement Centre
Pierre Falardeau	Centre de Développement du Porc du Québec
John Gough	Ontario Swine Improvement
Pat O'Meara	Western Swine Testing Association
Adrian Power	Atlantic Swine Improvement Centre
Phil Smith	Ontario Swine Improvement
John Vande Glind	Western Swine Testing Association

Directors present at the meeting were Auger, Boudreau, Dion, Evans, Falardeau, Gough, O'Meara, Power, Smith and Vande Glind.

1. Message from Chair
J. Vande Glind opened the meeting at 10:30 am. The Chair's message is shown on page 3 of the 2002/03 Annual Report.

2. Approval of Agenda
Moved by Gough. Seconded by Evans. Carried.
That the agenda be approved as circulated.

3. Approval of minutes from the last Annual Meeting
Moved by Dion. Seconded by Power. Carried.
That the minutes be approved as circulated.

4. Activity Reports

4.1 General Manager's Report

The General Manager's report was presented by B. Sullivan and is shown on pages 8 and 9 of the 2002/03 Annual Report.

4.2 Chief Geneticist's Report

The report of the Chief Geneticist was presented by Dr. P.K. Mathur and is shown on pages 10 to 13 of the Annual Report.

4.3 Chief, Computer Services' Report

The report of the Chief, Computer Services was presented by J. Groves and is shown on page 14 of the Annual Report.

5. Presentation and Approval of CCSI's Financial Statements

5.1 Financial statements for year completed March 31, 2003

Moved by Falardeau. Seconded by Gough. Carried.
That CCSI's financial statements for 2002/03 be approved as circulated.

5.2 Selection of an Auditor

Moved by Evans. Seconded by Gough. Carried.
That Bath Haché LLP be selected as the firm to conduct the next financial audit for CCSI.

6. CCSI Awards

J. Chesnais and Henry deWolde were the winners of the Brian Kennedy Memorial Award for 2002/03. These awards were presented at the Genetics for Swine Producers Seminar on June 17, 2003. Jean-Paul Vermette was the winner of the CCSI Swine Breeders' Merit Award. P. Falardeau read a summary of M. Vermette's contributions and accomplishments. The award will be presented at CDPQ's next annual meeting.

7. Names of Directors appointed to CCSI's 2003/04 Board

The composition of the Board of Directors for 2003/04 is shown at the beginning of these minutes and are listed in Appendix 1.

8. Other business

There was no other business.

8. Adjournment

Moved by Evans that the meeting be adjourned.

The meeting was adjourned at 12:00 Noon

4. Activity Reports

4.1 General Manager's Report

We look back at the completion of another very challenging year for the swine industry in Canada and internationally. Keeping pace with changes clearly requires an on-going effort, and this is not something Canadians shy away from. On the contrary, Canada strives to maintain its position at the head of the pack, and not simply follow the leaders and try to play catch up. Simple to say, but being a leader is not so simple in practice. We have to be constantly adapting and moving rapidly, but even more importantly, we need to know what directions to be moving. We also need to be prepared to set out in new directions in some cases, but without sacrificing the gains of the past.

The evidence for Canada's success as a leader is reflected in the large and growing international demand for Canadian pork. The fact is that Canada produces a very high quality pork product very efficiently. Genetics, although not the only factor, is the foundation of this success. And yet, genetic improvement would be one of the easiest things for the industry to let go of, especially in difficult times. The benefits from investing in genetic improvement are not instant. In fact, it takes several years to see the benefits. However, once they arrive, the benefits are permanent and stay with the industry for ever. New improvements continue to build on top of what Canadian genetic suppliers have been doing for many decades.

It is very encouraging to see that Canada has not only continued to invest in genetics in the past year, it has actually invested more. These new investments are coming from several different sources. Genetic suppliers, producers, packers, regional centres, CCSI and governments are all contributing. More and more there is a recognition that we have to do this, and we have to pull all players together. Canada is rather unique in its ability to do this in spite of the fact that our industry is made up largely of independent businesses. How does this happen? I would suggest that historically it has come from strong leadership in government Agriculture departments, and today it is in the strength of our many industry organizations.

CCSI's strength comes from the strength of its member organizations, and the desire of these organizations to pull together. Genetic suppliers, producers and packers are all represented from coast to coast. CCSI must have a broad focus to serve all its members, and yet it must also provide very specific services to meet the needs of the individuals. There have been important developments in the last year which both broaden the focus and fine-tune the specific services that CCSI can provide. I encourage you to read carefully the Chief Geneticist's and Computer Services Manager's reports for specifics.

There are many new developments and tools available, and many more to come. We need to make the best use of these tools, and we have to continue to develop. Canada is very clearly not alone at the front of the pack. One key activity in the last year was to initiate a comparison of Canada's genetic improvement program to those in other leading countries. The evidence is strong that we are among the best, but best is a fast moving target. It isn't enough to be content with where we are, because every year the best will need to be better.

I would commend the leadership and vision of CCSI's member organizations, provincial governments and Agriculture and Agri-Food Canada, who have collectively chosen to continue to support and to invest even more in genetic improvement in the past year, in spite of difficult economic times for the industry. This vision will continue to be a key factor in keeping Canada as a leader in pork production.

In closing, I would like to express my personal gratitude to the many individuals that have helped me in my first year as General Manager of CCSI. A special thanks to the rest of the staff at CCSI who are there day in and day out, and quite often night in and night out to ensure that the job is

getting done. Thank you to John and the rest of the Board for their continual support, encouragement and wisdom. And finally, thanks to all the management and staff at CCSI's member organizations, other industry partners and the users of CCSI services. Working together we truly are making a difference for the Canadian industry, and we are very much looking forward to another exciting and successful year at CCSI.

Brian Sullivan, General Manager

4.2 Chief Geneticist's Report

One more year of continued success of the program has been completed. Last year was again an example of working together with the industry partners. CCSI's team got much more involved in participation in the activities of our member organisations. I would take this opportunity to thank the staff of our member organisations and CCSI for their co-operation. Here are highlights of some of the activities and results that we jointly obtained.

1. Genetic Improvement

There has been significant change in the rate of genetic improvement for traits evaluated in the Canadian Swine Improvement Program. The gains during the last six years amount to a reduction of about 8.9 days of age to market weight, 1.7 mm reduction in backfat, 131 g less feed per kg of growth, 0.84% higher lean yield and 1.5 sq cm larger loin eye area in the market hogs and about 1.22 extra pigs in the litter. As a result, a commercial herd on average will be about $217 per sow per year more productive from 2003 genetics compared to genetics that were available in 1997. The genetic changes in Yorkshire, Landrace and Duroc breeds and expected genetic improvements in market hogs are given in Appendix 4.

The trends in genetic improvements in growth, lean yield, loin eye area and feed conversion have continued. Remarkable improvements are underway in the litter size in the maternal lines, especially in the Yorkshires as given in Appendix 5. There is a trend towards differentiation of Duroc as a sire line and Yorkshire and Landrace as dam lines. This focus on specialised sire and dam lines is a positive trend and we hope this will continue.

The average performance levels for backfat, age and litter size for different breeds, sexes and regions are given Appendix 6 and 7. The number of pigs tested has remained similar to last year for the major breeds while there is some decline for other breeds.

2. New services

CCSI's website now offers individual member login and customized menus for each member. Most of the pages are now provided both in English and in French. Several new applications and reports have been added. The web application, "Computer dating" allows the users to define their own breeding goals, develop customised selection indices, rank pigs, and calculate expected genetic gains based on tentative matings. New pages have been developed for the program "Breeding for Profit" to review the results of the selection in nucleus herds. New pages are dedicated to breeders participating in the Canadian Genetics Sharing Agreement. Moreover, a new self-serve option allowing the Regional Centres to load their own data into CCSI's database has been developed and has been used for the past several months. A new option for electronic registration has been added to the website. This tool uses data that has been collected in the performance testing program. In a matter of minutes, litters can be selected and electronically delivered to CLRC for registration. More information is available in the report from Jim Groves, CCSI's Computer Services Manager.

3. Projects

The year 2003 marked completion of the project on "Developing new assessment and genetic evaluation methods to increase pork quality and the economic efficiency of pork production" jointly supported by the swine industry and the IRAP program of the National Research Council. This project helped in development of methods for evaluating traits of sow productivity, conformation, feed efficiency, the on-farm genetic evaluation module and new web services.

A feasibility study, working jointly with PEI Pork and PharmaGap, led to the in-vitro SDR Test for evaluation of disease resistance without immunising pigs. The new test will be useful in selecting pigs that are genetically more resistant to diseases and thereby reducing the risk of disease outbreaks.

The formulas to obtain Canadian equivalents of French EBVs for litter size, age and backfat have been updated with recent data. A new report on French animals is also available on the website.

CCSI has recently completed the research project on use of molecular information for genetic improvement of pork production in partnership with AAFC under the CARD program. This project evaluated the current situation, identified most promising genes and markers, and developed genetic methods and a strategic plan for use of molecular information by the swine industry. The project identified a number of genes and markers that will help improve pork quality and the efficiency in pork production, namely the IGF2 gene for uniform leaner pork and HFABP gene for good marbling and taste. The project recommended that frequencies and effects of the genes be further validated under Canadian conditions prior to their widespread uses. New simplified models have been proposed for use of the information in genetic evaluations. The strategic plan outlines important activities and priorities for use of available genes; to continue the search for new genes and markers, and prepare the industry for future advancements. One of the key recommendations is to establish a national DNA Bank for further research and use of molecular information by the industry.

A meeting of the working group on Swine Molecular Genetics on March 4-5, 2004 included representatives from the industry, regional centres, federal research labs and universities in Canada and the US. The group discussed the strategic plan for the Canadian swine industry. This was followed by a training course on selection using molecular information.

A pilot project on genetic evaluation for meat quality (colour, marbling, pH and drip loss) has been completed. This involved a review of genetic parameters, development of necessary adjustment factors and development and testing of genetic evaluation models. The EBVs for these traits can be calculated routinely provided there are new data on these traits.

A project has been developed with WSTA on recording and genetic evaluation of meat quality traits. The funding for this project has been approved by Alberta Livestock Industry Development Fund (ALIDF). A working group on meat quality measurements was also created as a start of a national standards committee, to define a common measurement program available for the entire industry.

A project on the review of Duroc as a terminal sire line has been completed. This project was partly supported by the AIMS program of Agriculture and Agri-Food Canada and Canadian Swine Exporters Association (CSEA). The review has suggested that Duroc breed remains one of the best choices for terminal sires for use on most of the commercial sows. Many trials have shown the advantage of the Duroc breed for growth, feed conversion, and confirmed the tremendous advantage of this breed for meat quality. Compared to Piétrain and Hampshire, Duroc-sired hogs may show slightly lower levels of lean content but higher dressing yield, while pork meat quality is usually in favour of Duroc, especially marbling, tenderness and juiciness. A report on Durocs has been circulated at trade shows in Europe.

CCSI started to look into the issues of birth defects since last August in response to some inquiries about genetic control of ridgling and ruptures. A review has suggested that ridgling and scrotal rupture are highly heritable defects with intermediate to high heritabilities. There is a large potential to reduce the incidence rates through a program of genetic evaluation and selection.

New genetic evaluations for piglet survival have been developed and information has been circulated for recording the data. New evaluations have also been developed for number of teats

and work is in progress for evaluation of feet and legs. These evaluations will be offered through online tools on CCSI's website.

4. Workshops and seminars

A Consultation Forum on Canadian Pork Quality was held November 26th in Ottawa. Speakers and participants from the different sectors of the pork value chain gave important input on pork quality issues and strategies needed to meet the industry needs in terms of meat quality. There was a general consensus on the needs for better communication, co-ordination by national organisations like CCSI and more work to improve pork quality to meet the market requirements.

CCSI in cooperation with OSI, Ontario Pork and OMAF, organised a successful seminar for producers in Stratford at the time of CCSI's Annual Meeting. The main theme was genetics for the producer, including how producers can make the most of genetics today and in the future. There were about 90 registrants, including several from as far away as PEI and Alberta.

CCSI researchers have attended and contributed papers in International scientific meetings. These include the European Association of Animal Production annual meeting, held in Rome in August 2003, Genomics for Pork Quality in Paris, NSIF meeting, in DesMoines, Iowa, and The Research Swine Days, held in Paris. These meetings have also helped in networking with several lead researchers from around the world.

5. National Committees

This year, CCSI participated in a number of committees. The National Pork Value Chain Roundtable was one of them. The main aim of this roundtable is to develop a common front and adopt a coordinated approach to planning and decision-making for the Canadian pork industry. The work of the Roundtable has focused on Cooperation and joint action; and on maintaining Canada's position as the world's number one pork exporter. The discussion has focused on four main themes: animal health, food safety, meat quality and responsiveness to consumer and citizen needs.

I had the pleasure and privilege to serve as a director for the Canadian Farm Animal Genetic Resource Foundation (CFAGRF). The foundation has made remarkable progress during this year. I would encourage you to read the "Gene Scene" news letter for updates on the foundations activities. Recently, AAFC has approved funding for the establishment of a Livestock and Poultry Germplasm Centre proposed by the foundation.

CCSI also participated in the consultation by AAFC on the revision of the CARD program, a meeting on Funding Agricultural Research organised by the Canadian Agri-food Research Council (CARC) and consultations on the current status and anticipated developments in the regulation of animal biotechnology in Canada orgnised by the Animal Biotechnology Unit (ABU) of the Canadian Food Inspection Agency (CFIA) in regulation of animal biotechnology.

CCSI represented CSBA on the National Hog Identification and Traceability System Working Committee and Canadian Agriculture and Food International (CAFI) Program committee.

I would like to thank the members of these committees for the cooperation extended to us.

6. Future plans

New genetic evaluations are nearing completion for meat quality traits, conformation traits and perinatal piglet survival. During the next months, new methods will be developed to include these EBVs in selection indices and new tools and reports will be developed for the users. Efforts are also underway to develop on-line evaluations for currently used traits and to provide the national genetic evaluations more frequently.

One important objective is also to maintain efforts on the delivery of web-based genetic evaluation services, for regional centres and individual users. A new project also involves information on slaughter data that could be available for producers through CCSI website.

CCSI has started efforts to work more closely with member organisations. These efforts have already resulted in formal agreements with two member organizations, CDPQ and CSBA, for services and increased collaboration. Several other informal initiatives are also underway with other members. This closer collaboration will help us all to meet the future challenges of the swine industry in the area of genetic improvement.

I will end by acknowledging contributions from the dedicated technicians across Canada, staff of the regional centres and genetics committee members. Thanks to Brian, Yuefu, Laurence, Jim, David, Li and Francine, the members of our team here at CCSI.

A list of the reports on some of the above activities is given in Appendix 8. These reports are available on CCSI's website at: www.ccsi.ca/reports_2003/main.cfm

Pramod Mathur
Chief Geneticist, CCSI
June 2004

4.3 Computer Services Manager's Report

This past year has seen tremendous progress in the information systems area. From a new website, to internal upgrades, to new partnerships, it was a busy but successful year.

Significant effort and progress has been made on the new website. Since launching the website one year ago, we have welcomed over 200 individual members who have signed in over 3500 times!

The redesigned EDI has been in place for several months now, allowing regional centers to send and edit their data at any time. With the dedicated work of the regional centers and breeders, the error rate is significantly lower than previous years. As training for EDI continues, we expect that trend to continue.

In addition to transferring data to CCSI through the EDI web pages, a new approach has been developed in co-operation with OSI and Herdsman on-farm software. This approach allows an application to send and receive information with CCSI. In the OSI project, for example, the Herdsman on-farm software can send probe and pedigree information to CCSI and retrieve EBV's. This allows a more seamless integration between the on-farm software and the central CCSI database, using nothing more than a "button" from the user point of view.

The second part of the OSI project involves on-farm evaluations being done at CCSI over the internet, instead of locally using the on-farm software. After sending probe data directly to CCSI, the on-farm evaluations are calculated and stored in the CCSI database in real time. These results can then be viewed and printed. With the on-farm evaluations stored in the CCSI database, there are a number of reports that are now possible that were not before.

Due in large part to these developments, we are now actively preparing and testing for the introduction of bi-weekly evaluations. It is expected that testing will take about two months, with implementation to happen as soon as practically possible after that. It should be noted that with bi-weekly evaluations, the time frame with which data transfers between the regional centers and CCSI will also need to be improved. Each region is unique, and we are working with each one to ensure a smooth transition.

There have been constant additions and improvements to the website over the course of the year, and that will continue. Some of the highlights of the past year include improvements to computer dating, probe reports by management group, herd activity reports, genetic sharing, connectedness, and breeding for profit. It is planned that the old website will no longer be needed within the next several months, as all reports and applications will be available on the new website.

A project to introduce an evaluation system for goats similar to swine is well underway. From the information systems perspective, the database and associated evaluations programs and scripts have been created. Various web pages have been developed that allow breeders to search and edit their own data, and report on their genetic improvement.

As part of the management contract CCSI has with CSBA, we are now hosting the CSBA website and electronic mail. In the coming months we will be updating the CSBA website with a new look, as well as integrating it with our development tools. This will allow some interesting opportunities to share information between the two organizations that were not possible before.

Several new evaluations will be introduced in the coming months, with the associated programs, scripts, reports, and web pages to support them. Including both the new evaluations and moving to bi-weekly evaluations, we will be using over four times our current computer resources!

A pilot project is underway in Alberta to supply information services for the commercial producers. Various web pages have been created to show carcass and sow productivity data, and how that data compares to a grading system.

A way to electronically register litters with the CLRC, through the CCSI website, has been developed. Using performance data from CCSI, all the litters that are available to be registered are listed, including going back the necessary number of generations. This project is going through the final testing phase, and will be generally available by the end of the summer.

As we continue to move forward, the server that does our main evaluations is close to four years old. This increases support and equipment costs, as well as the possibility of increased down time due to component failures. Over the course of the next several months we will be evaluating our options for a new server, including the possibility of using Linux as an operating system.

There are other servers and workstations that will also need attention in the coming year. We intend to upgrade our electronic mail server, our firewall, and several workstations as time permits.

Although much has been accomplished, there is still much to do. Among the many other things they do, I would like to especially thank Li Li for ensuring the evaluations run smoothly, and David Bates for ensuring the databases run smoothly.

Jim Groves, Computer Services Manager, CCSI

5. Appendices

Appendix 1. Members of the Board of Directors

Appendix 2. People at CCSI

Appendix 3. Genetics Committee Members & Participants

Appendix 4. Genetic change in purebreds and market hogs

Appendix 5. Genetic Improvement trends

Appendix 6. Home Test Summary For Backfat And Age At 100 Kg

Appendix 7. Sow Productivity Summary (2003)

Appendix 8. Reports on activities

Appendix 9. Breeders Participating In The National Program

Appendix 10. Participating A.I. Centres

Appendix 1. Members of the Board of Directors

André Auger, Canadian Swine Breeders Association

Stanley Boudreau, Canadian Pork Council

Larry Campbell, Canadian Meat Council

Bernard Dion, Centre de Développement du Porc du Québec Inc

Pierre Falardeau, Centre de Développement du Porc du Québec Inc

John Gough, Ontario Swine Improvement Inc.

Donald MacDonald, Atlantic Swine Centre

Phil Smith, Ontario Swine Improvement Inc.

John Vande Glind, Western Swine Testing Association

Alfred Wahl, Western Swine Testing Association

Appendix 2. People at CCSI

Brian Sullivan, General Manager

Pramod Mathur, Chief Geneticist

Francine Roy, Secretary and Office Manager

Jim Groves, Computer Services Manager

David Bates, Programmer/Database Administrator

Laurence Maignel, Geneticist

Li Li, Programmer/Analyst

Yuefu Liu, Geneticist

Appendix 3. Genetics Committee Members

Name	Organization
Andy Robinson, Chair	University of Guelph
André Fortin	Agriculture Canada
Austin Murray	Agriculture Canada
Bob Kemp	Keystone Pig Advancement Inc.
Brian Sullivan	Canadian Center for Swine Improvement
Cathy Aker	Ontario Swine Improvement
Charles Rodrigue	Alliance Duroc
David Trus	Agriculture Canada
Jon Meadus	Agriculture Canada
Laurence Maignel	Canadian Center for Swine Improvement
Luc Pelletier	Centre de développement du porc du Québec Inc
Margaret Quinton	University of Guleph
Muriel Power	Atlantic Swine Center
Murray Duggan	Fast Pigs Inc.
Nicole Dion	Sogéporc
Patrick Charagu	Genex Swine
Pramod Mathur	Canadian Center for Swine Improvement
Roger Cue	Mcgill University
Wim Van Berkel	Western Swine Testing Association
Yuefu Liu	Canadian Center for Swine Improvement

Genetics Committee, Québec City, May 2004

Appendix 4: Genetic change in purebreds and market hogs

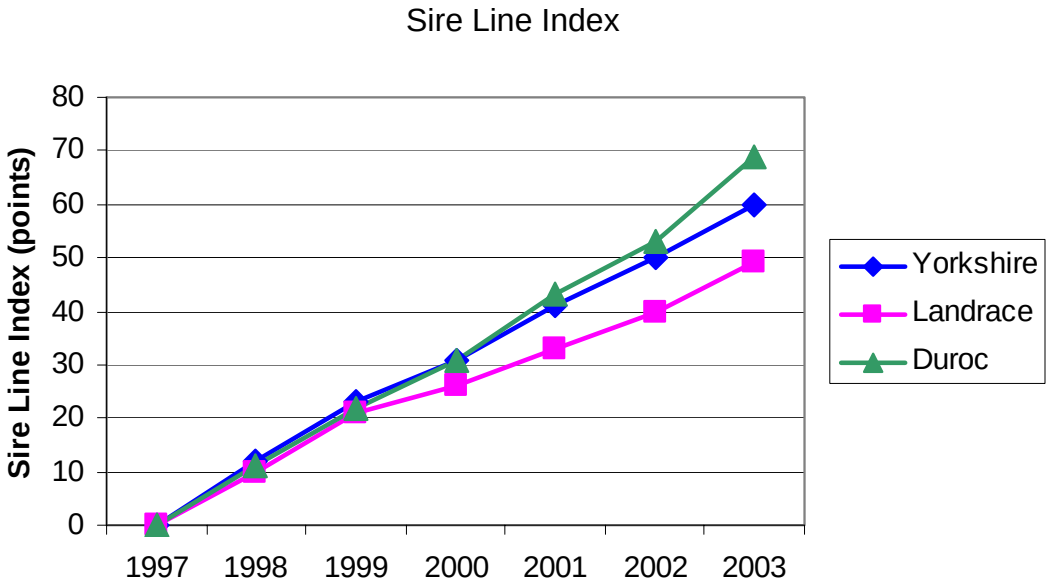
Yorkshire						
Trait	**1997**		**2003**		**Total change**	**Average Gain per year**
	#pigs	**EBV average**	**#pigs**	**EBV average**		
Sire Line Index (pts)	38525	44	41766	104	60 pts	10
Dam Line Index (pts)	38525	40	41759	105	65 pts	11
Lean Yield	38525	-0.49	41766	0.04	0.53 %	0.09
Loin Eye Area	38525	-0.6	41766	0	0.6 sq cm	0.1
Age	38525	8.5	41766	-0.6	-9.1 days	-1.5
Feed Conversion	38525	0.115	41766	-0.009	-0.124 kg/kg	-0.021
Backfat	38525	1.2	41766	-0.1	-1.3 mm	-0.2
Lean Depth	38525	-0.1	41766	0	0.1 mm	0.01
Number Born	38525	-1.26	41759	0.11	1.37 pigs	0.23
Sire Line Index ($)	38525	-25	41759	2	27 $	4.50
Dam Line Index ($)	38525	-28	41759	2	31 $	5.17

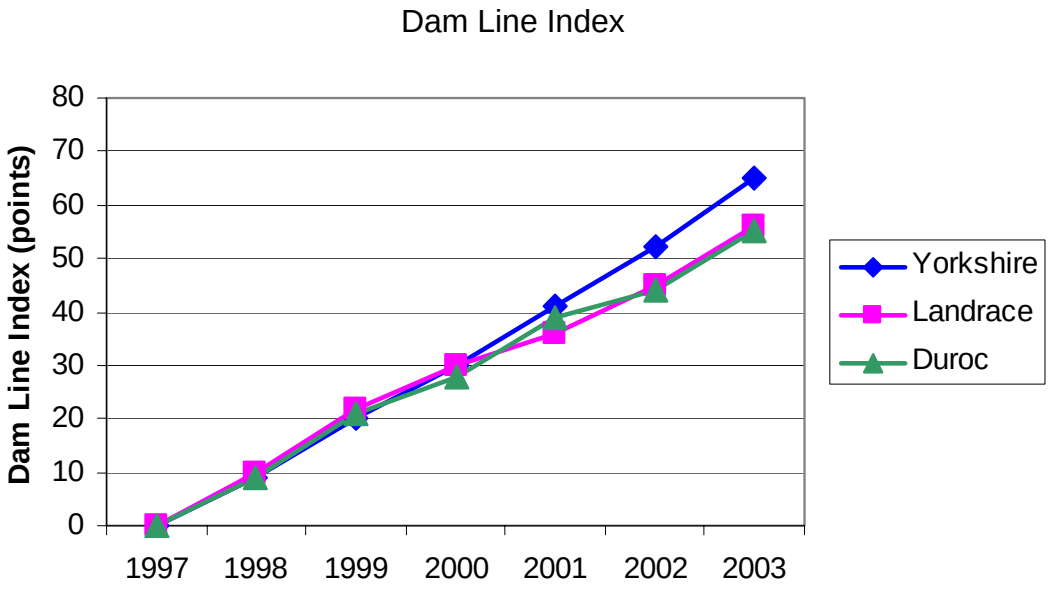
Landrace						
Trait	**1997**		**2003**		**Total change**	**Average Gain per year**
	#pigs	**EBV average**	**#pigs**	**EBV average**		
Sire Line Index (pts)	30691	55	29878	103	49 pts	8
Dam Line Index (pts)	30691	48	29870	104	56 pts	9
Lean Yield	30691	-0.67	29878	0.03	0.7 %	0.12
Loin Eye Area	30691	-1.2	29878	0.1	1.3 sq cm	0.2
Age	30691	6.8	29878	-0.6	-7.4 days	-1.2
Feed Conversion	30691	0.1	29878	-0.008	-0.108 kg/kg	-0.018
Backfat	30691	1.3	29878	0	-1.4 mm	-0.2
Lean Depth	30691	-0.6	29878	0.1	0.7 mm	0.1
Number Born	30691	-0.98	29870	0.09	1.07 pigs	0.18
Sire Line Index ($)	30691	-23	29870	2	25 $	4.17
Dam Line Index ($)	30691	-24	29870	2	26 $	4.33

Duroc						
Trait	1997		2003		Total change	Average Gain per year
	#pigs	EBV average	#pigs	EBV average		
Sire Line Index (pts)	18560	44	14436	113	69 pts	12
Dam Line Index (pts)	18560	53	14436	108	55 pts	9
Lean Yield	18560	-0.82	14436	0.23	1.06 %	0.17
Loin Eye Area	18560	-1.5	14436	0.5	2 sq cm	0.3
Age	18560	8.6	14436	-1	-9.6 days	-1.6
Feed Conversion	18560	0.12	14436	-0.025	-0.145 kg/kg	-0.024
Backfat	18560	1.8	14436	-0.3	-2.1 mm	-0.4
Lean Depth	18560	-0.9	14436	0.3	1.2 mm	0.2
Number Born	18560	-0.07	14436	0.01	0.08 pigs	0.01
Sire Line Index ($)	18560	-38	14436	5	42 $	7.00
Dam Line Index ($)	18560	-16	14436	2	18 $	3.00

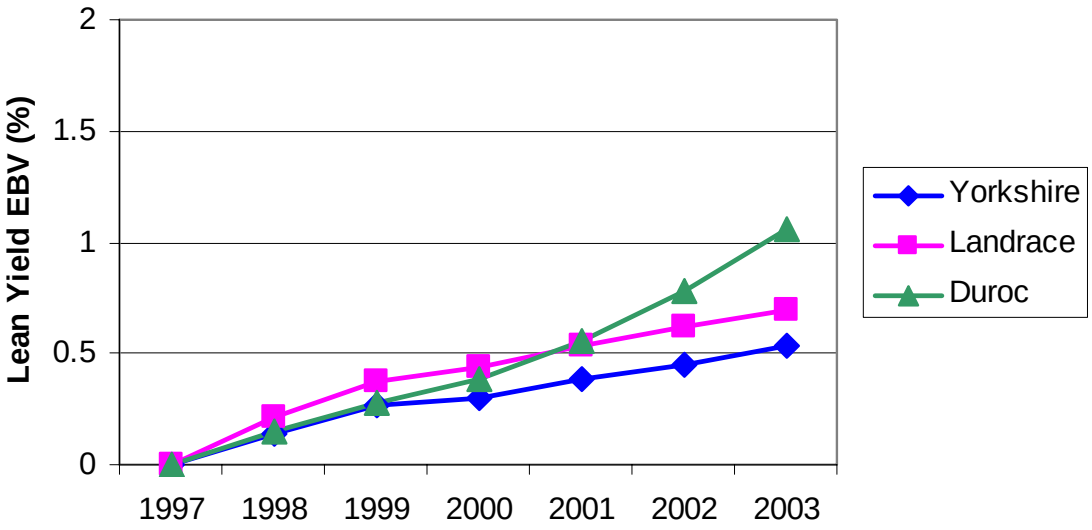
Change in Commercial Sows (F1s) and Hogs due to genetic improvement in Canada from 1997 to 2003					
	Sire Line Duroc	Dam Line			Market Hogs
Trait		Yorkshire	Landrace	F1s	
Sire Line Index (pts)	69				
Dam Line Index (pts)		65	56	61	
Lean Yield	1.06	0.53	0.7	0.61	0.84 %
Loin Eye Area	2	0.6	1.3	1	1.5 sq cm
Age	-9.6	-9.1	-7.4	-8.3	-8.9 days
Feed Conversion	-0.145	-0.124	-0.108	-0.116	-0.131 kg/kg
Backfat	-2.1	-1.3	-1.4	-1.3	-1.7 mm
Lean Depth	1.2	0.1	0.7	0.4	0.8 mm
Number Born		1.37	1.07	1.22 pigs	
Sire Line Index ($)	$ 42				
Dam Line Index ($)		$ 31	$ 26	$ 56	

Appendix 5: Genetic Improvement trends

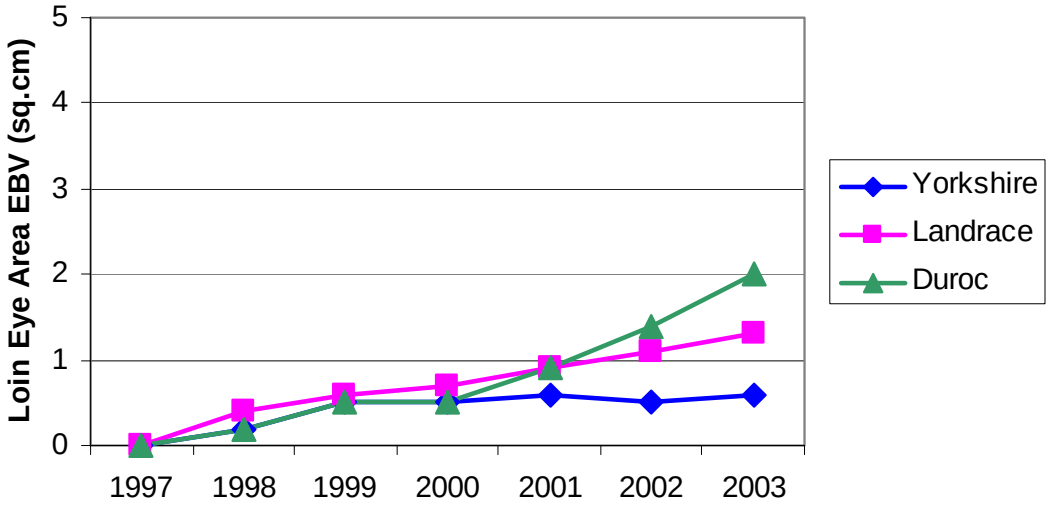


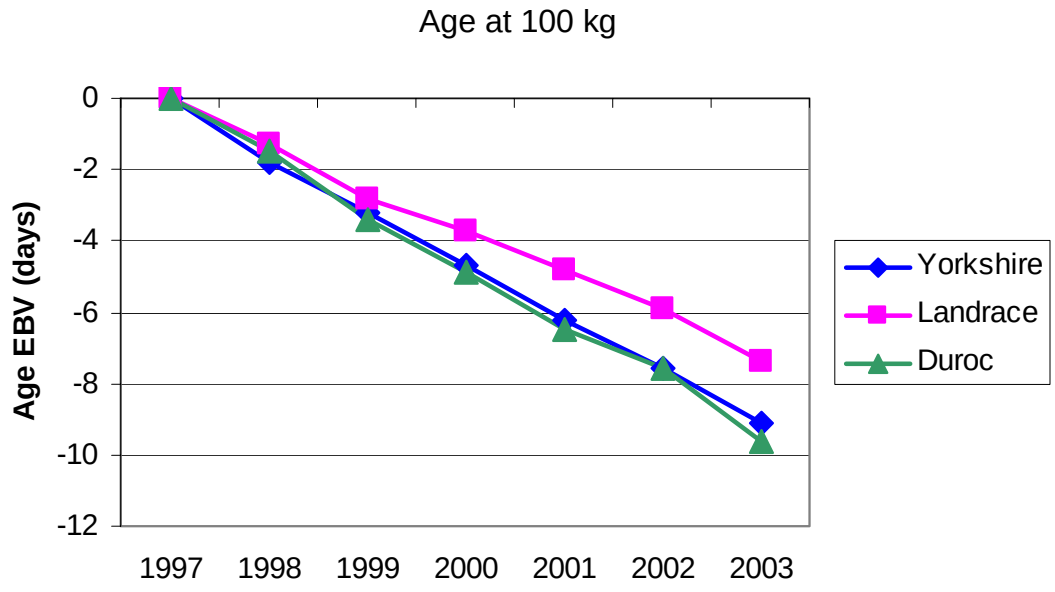


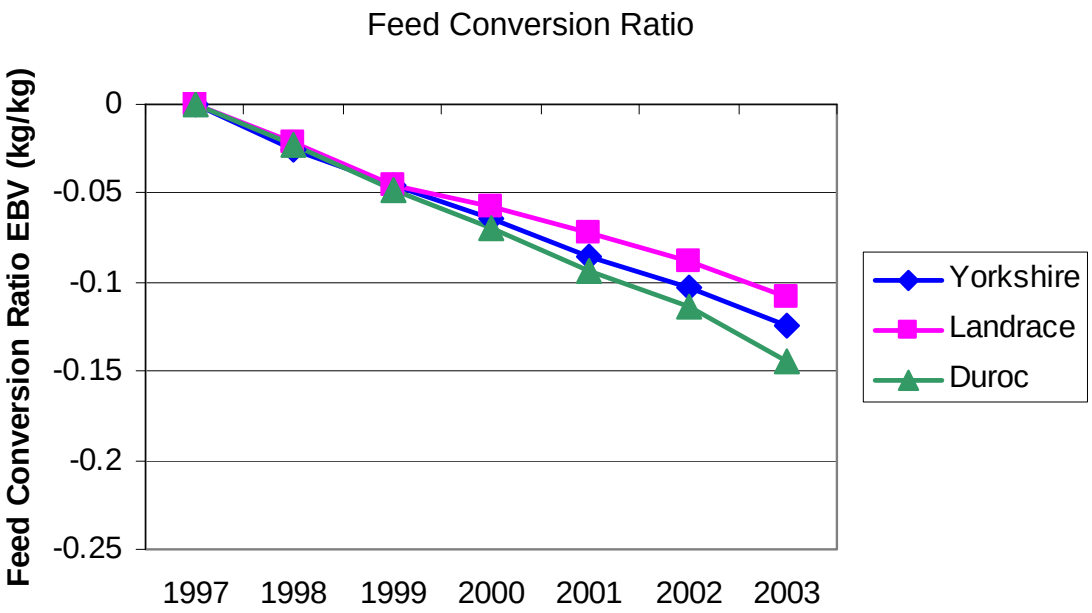
Lean Yield

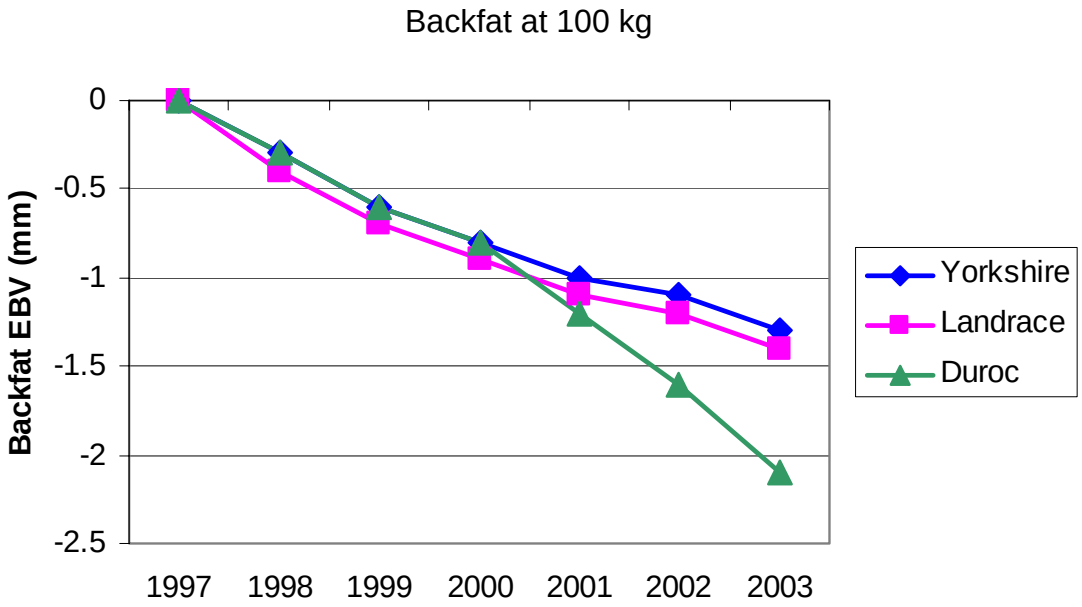


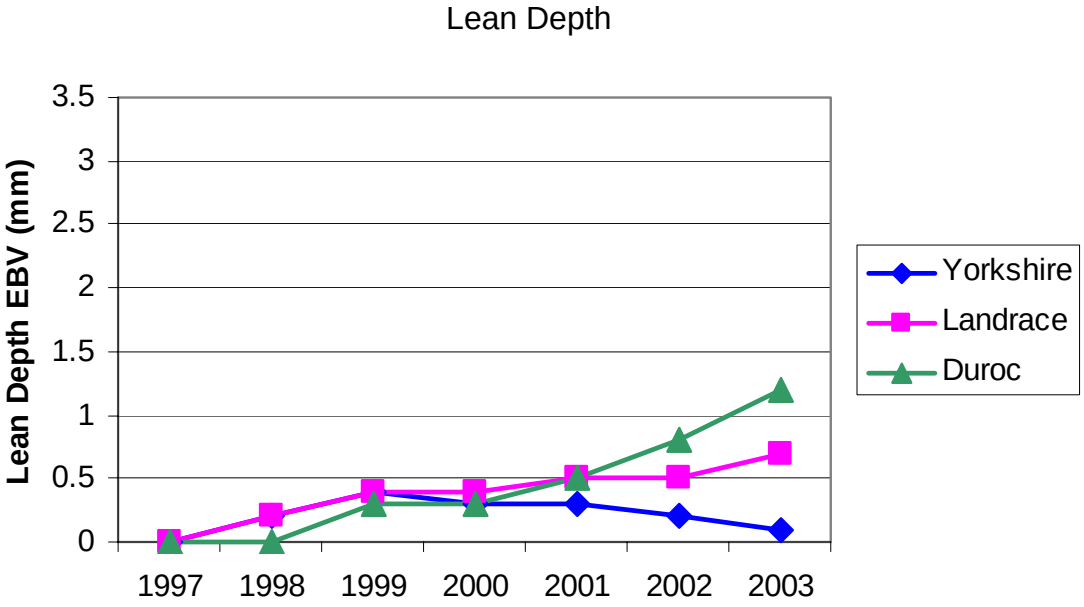
Loin Eye Area

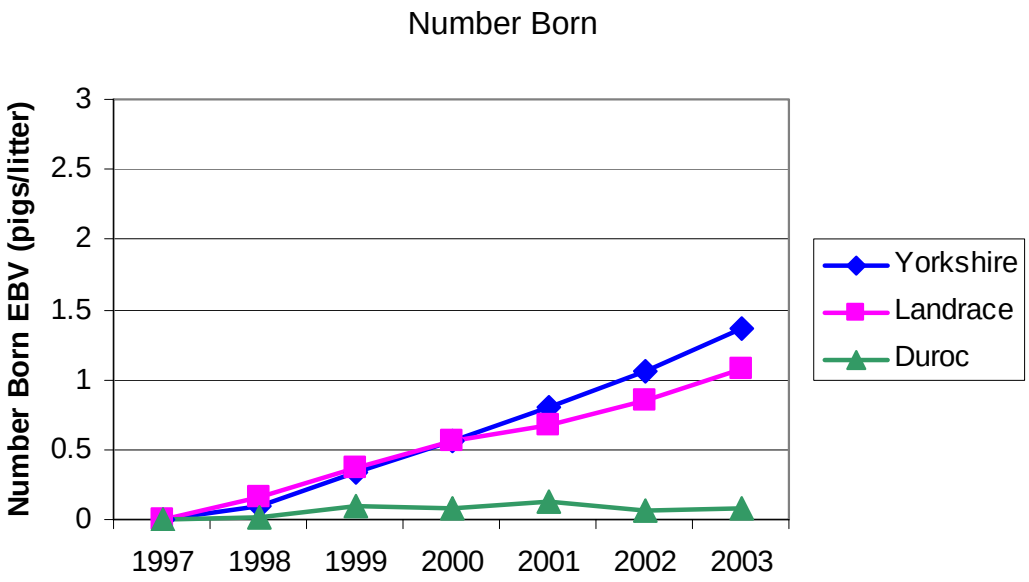



Age at 100 kg
Age EBV (days)
0
-2
-4
-6
-8
-10
-12
1997
1998
1999
2000
2001
2002
2003
Yorkshire
Landrace
Duroc


Feed Conversion Ratio
Feed Conversion Ratio EBV (kg/kg)
0
-0.05
-0.1
-0.15
-0.2
-0.25
1997
1998
1999
2000
2001
2002
2003
Yorkshire
Landrace
Duroc


Backfat at 100 kg
Backfat EBV (mm)
0
-0.5
-1
-1.5
-2
-2.5
1997
1998
1999
2000
2001
2002
2003
Yorkshire
Landrace
Duroc


Lean Depth
Lean Depth EBV (mm)
3.5
3
2.5
2
1.5
1
0.5
0
1997
1998
1999
2000
2001
2002
2003
Yorkshire
Landrace
Duroc


Number Born
Number Born EBV (pigs/litter)
3
2.5
2
1.5
1
0.5
0
1997
1998
1999
2000
2001
2002
2003
Yorkshire
Landrace
Duroc

Appendix 6. Home Test Summary For Backfat And Age At 100 Kg

April 1, 2003 to March 31, 2004

				male averages			female averages		
		#herds	#pigs tested	#boars	backfat (mm)	Age (days)	#gilts	backfat (mm)	Age (days)
Atlantic	Yorkshire	7	2009	623	9.5	143	1386	10.1	147
	Landrace	7	624	242	9.7	146	382	10.1	147
	Duroc	6	452	190	10.2	148	262	11.1	153
	Others	6	166	66	10.9	146	100	12.4	159
	All breeds	7	3251	1121	9.7	144	2130	10.3	148
Quebec	Yorkshire	45	15890	6155	9.5	150	9735	10.2	159
	Landrace	38	10149	3705	9.5	150	6444	9.8	157
	Duroc	32	6564	3315	9.6	150	3249	10.7	156
	Others	3	203	87	12.7	145	116	15.3	147
	All breeds	51	32806	13262	9.6	150	19544	10.2	158
Ontario	Yorkshire	29	9513	1819	10.8	150	7694	11.2	156
	Landrace	23	5998	944	11	150	5054	11.7	152
	Duroc	25	3251	1280	11.2	150	1971	11.7	154
	Others	5	143	40	11.3	156	103	12.3	158
	All breeds	30	18905	4083	11	150	14822	11.5	154
West	Yorkshire	21	13813	2976	10.9	149	10608	11.4	155
	Landrace	22	14033	2827	11	148	11206	11.7	152
	Duroc	16	3781	1537	10.9	150	2082	12.1	157
	Others	11	1995	1650	11.4	148	345	11.8	171
	All breeds	25	33622	8990	11	149	24241	11.6	154
Canada	Yorkshire	102	41225	11573	10.1	150	29423	10.9	156
	Landrace	90	30804	7718	10.2	149	23086	11.2	154
	Duroc	79	14048	6322	10.3	150	7564	11.3	155
	Others	25	2507	1843	11.5	148	664	12.6	163
	All breeds	113	88584	27456	10.3	149	60737	11.1	155

Appendix 7. Sow Productivity Summary (2003)

	Parity	#herds	total pigs born		pigs born alive		pigs weaned	
			N	Average	N	average	N	average
Yorkshire	1	104	7675	11.0	7631	10.0	7333	9.1
	2	95	6111	11.6	6101	10.8	5937	9.6
	3	91	4694	12.0	4683	11.0	4542	9.7
	4	89	3309	12.3	3307	11.1	3207	9.5
	5	81	2190	12.2	2182	10.9	2112	9.3
	6	79	1535	12.1	1533	10.6	1483	9.1
	7	72	2306	11.1	2302	9.8	2226	9.1
	ALL	104	27820	11.6	27739	10.6	26840	9.4
Landrace	1	95	5160	10.9	5135	10.2	4869	9.2
	2	92	4328	10.8	4315	10.2	4163	9.5
	3	82	3499	11.3	3495	10.6	3409	9.6
	4	76	2352	11.5	2345	10.7	2278	9.5
	5	72	1494	11.2	1488	10.4	1441	9.3
	6	67	961	10.9	958	10.0	927	9.1
	7	66	1317	10.4	1312	9.5	1267	9.0
	ALL	101	19111	11.0	19048	10.3	18354	9.4
Duroc	1	68	1641	9.4	1628	8.4	1497	8.0
	2	64	1129	10.1	1126	9.2	1060	8.3
	3	63	720	10.6	718	9.4	679	8.2
	4	58	460	10.3	453	9.1	423	8.0
	5	39	286	10.7	285	9.0	269	7.4
	6	32	186	11.4	186	9.4	173	7.2
	7	23	144	10.7	143	8.7	136	7.2
	ALL	71	4566	10.0	4539	8.9	4237	8.0
All 3 breeds	1	117	14476	10.8	14394	9.9	13699	9.0
	2	113	11568	11.2	11542	10.4	11160	9.5
	3	108	8913	11.6	8896	10.7	8630	9.5
	4	105	6121	11.8	6105	10.8	5908	9.4
	5	95	3970	11.7	3955	10.6	3822	9.2
	6	94	2682	11.6	2677	10.3	2583	9.0
	7	88	3767	10.9	3757	9.7	3629	9.0
	ALL	119	51497	11.3	51326	10.3	49431	9.3

Appendix 8: Reports on activities

1. Genetic Improvement of Meat quality for the Canadian swine industry
2. Evaluation of sow productivity traits for selection of dam lines
3. Integration of molecular genetics in selection programs for swine
4. Marker Assisted selection for the Canadian swine industry
5. Duroc as a terminal sire line
6. Recording litter size and perinatal piglet survival
7. Sample size requirements for evaluation of meat quality traits
8. Heart Fatty Acid Binding Protein Gene for Improving Meat Quality
9. Insulin-Like Growth Factor 2 Gene for Leanness
10. Are ridgling and scrotal rupture caused by abnormal size of the inguinal canal ?
11. Conversion of French EBVs to Canadian Equivalents
12. Briefing notes of current status of the project on molecular genetics: an intermediate report
13. Swine Disease Resistance Assay
14. Computer dating: A tool for customized mating decisions (User's guide)
15. Report on the 54th Annual Meeting of the European Association for Animal Production (Rome, August 2003)
16. Symposium on Genomics and the Meat Industry (Paris, October 2003)
17. NSIF meeting (Des Moines, December 2003)
18. Genetics for Swine Production Proceedings (Stratford, 2003)
19. CCSI Annual report, June 2003

These reports are available on CCSI's website at: www.ccsi.ca/reports_2003/main.cfm

Appendix 9. Breeders Participating In The National Program

Atlantic Swine Centre	
Reg & Donald Macdonald R.R. #1 Mount Stewart, PE C0A 1T0	PEI Quality Swine II 420 University Ave. #205 Charlottetown, PE C1A 4N7
Sunriver Farms R.R. #4 Cornwall, PE C0A 1H0	Willowdale Farms R.R. #1 York, PE C0A 1P0
Lloyd & Shirley Evans & Sons R.R. #1, 13842 Hwy #1 Wilmot, NS B0P 1W0	Maple Lane Farms Ltd. R.R. #3 Newport, NS B0N 2A0

Centre de Développement du Porc du Québec Inc	
Beauchemin, Sylvie 380, 1er Rang est Saint-Joachim J0E 2G0	Cie 2427 3963 Québec inc. 2693, boulevard Labelle, C.P. 484 Prévost J0R 1T0
Excel-Gène inc. 462, 2e Rang est Saint-Simon J0H 1Y0	Ferme Agral & fils inc. 160, route 363 Lac-aux-Sables G0X 1M0
Ferme Beau-Porc enr. 1691, 11e Rang Saint-Valérien J0H 2B0	Ferme C.-M. Labrecque enr. 1580, rang Saint-Étienne nord Sainte-Marie-de-Beauce G6E 3A7
Ferme Claude Forget inc. 841, 4e Rang Saint-Ambroise-de-Kildare J0K 1C0	Ferme Clauvie-Porcs (2002) inc. 202, rang 6 est Saint-Donat G0K 1L0
Ferme Cogeporc inc. 404, Saint-François Saint-Narcisse-de-Beaurivage G0S 1W0	Ferme Denis Vadnais inc. 3320, Chemin Tourville St-Nicéphore J2A 3Y8
Ferme du Berceau inc. 94, 1er Rang ouest Saint-Gervais-de-Bellechasse G0R 3C0	Ferme du Laurier 167, rang de la Montagne Saint-Gervais-de-Bellechasse G0R 3C0
Ferme du Murier inc. 137, route Soucy, C.P. 154 Saint-Édouard de Lotbinière G0S 1Y0	Ferme F. Pilote et fils enr. 410, rang Saint-Pierre Saint-Irénée G0T 1V0
Ferme Géni-Porc inc. C.P. 1378 Bedford J0J 1A0	Ferme Grenier Pouliot inc. 2515, chemin Lehoux, R.R. 3 Coaticook J1A 2S2

Centre de Développement du Porc du Québec Inc	
Ferme J.-M. Nadeau et fils inc. 496, route Sainte-Thérèse ouest Sainte-Hénédine-de-Dochester G0S 2R0	Ferme J.P. Dion et fils inc. 154, rang Charlotte Saint-Liboire J0H 1R0
Ferme J.R. Raby senc 4222, rang de la Colline Adstock G0N 1S0	Ferme Jacques Ouellet 223, 6e Rang est Saint-Joseph-de-Kamouraska G0L 3P0
Ferme Liloporc inc. 414, rang Saint-Pierre Saint-Irénée G0T 1V0	Ferme Lorix-Québec enr. 841, chemin Tomifobia Stanstead J0B 3E0
Ferme Luc & Estelle Forget inc. 2553, rang Saint-Jacques Saint-Jacques J0K 2R0	Ferme Maguy enr. 810, St-Pierre Laurierville G0S 1P0
Ferme Nico enr. 473, rang Saint-Nicolas Saint-Irénée G0T 1V0	Ferme Perfo-Porcs inc. 1735, rang 10 Notre-Dame-du-Bon-Conseil J0C 1A0
Ferme Pleinchamps inc. 460, rang Saint-Pierre Saint-Anselme-de-Dorchester G0R 2N0	Ferme Porasseny inc. 16, des Prairies Saint-François G0R 3A0
Ferme porcine DAJO senc 135, rue Principale Saint-Simon J0H 1Y0	Ferme Porcine de Beauce inc. 1640, rang Saint-Gabriel sud, R.R. 2 Sainte-Marie-de-Beauce G6E 3A8
Ferme porcine Jagari inc. 6330, route 112 Garthby G0Y 1B0	Ferme Primiporc inc. 1, chemin Saint-Gabriel Saint-Gabriel-de-Brandon J0K 2N0
Ferme Raymond Coutu et fils senc 1861, route 158 Saint-Thomas J0K 3L0	Ferme Rechamakayajo enr. 507, rue Desjardins Mandeville J0K 1L0
Ferme René Gauthier inc. 404, rang Saint-Pierre Saint-Irénée G0T 1V0	Ferme Rouslay s.e.n.c. 954, rang La Ferme Sainte-Perpétue J0C 1R0
Ferme Saniporc enr. 167, chemin de la Montagne Saint-Gervais-de-Bellechasse G0R 3C0	Ferme Ste-Catherine enr. 404, rue Saint-François Saint-Narcisse-de-Beaurivage G0S 1W0
Ferme Triporc inc. 3250, Haut-de-la-Rivière Sainte-Elizabeth J0K 2J0	Ferme Victorien Fortin inc. 1346, rang Sainte-Anne Métabetchouan-Lac-à-la-Croix G8G 1A3
Groupe Dynaco Coopérative agroalimentaire 41, route 287 sud Saint-Philippe-de-Neri G0L 4A0	Hybrilia SEC 156, rue Grenier Laurierville G0S 1P0

Centre de Développement du Porc du Québec Inc	
J. & R. Perreault inc. 184, Saint-Jacques Saint-Patrice-de-Lotbinière G0S 1B0	Lemieux, Jean-Marc 76, rang 2 est Saint-Gervais-de-Bellechasse G0R 3C0
Les élevages Auger 850, chemin des Acadiens Yamachiche G0X 3L0	Les élevages Technos ltée 2080, rang 8 sud Adstock G0N 1S0
Les Porgreg inc. 8795, Chemin du Rapide-Plat Sud Saint-Hyacinthe J2R 2A6	Madeleine Hayeur enr. 724, rang Sainte-Hélène Sainte-Hélène-de-Bagot J0H 1M0
Porcherie B & M Dion inc. 500, Hyatt's Mills Compton J0B 1L0	S.C.A. Disraëli 815, avenue Champlain Disraëli G0N 1E0
S.C.A. Langevin 188, route 204, C.P. 39 Sainte-Justine G0R 1Y0	Sogéporc inc. - Filière des Érables 1025, rang Saint-Pierre Notre-Dame-de-Lourdes G0S 1T0
Sogéporc inc. - Filière des Marées 60, chemin du Cenellier La Trinité-des-Monts G0K 1B0	

Ontario Swine Improvement	
BMR Genetics Rod deWolde 12 Huston Street Millbrook, ON LOA 1G0	Bodmin Swine Genetics George Procter R.R. #5 Brussels, ON N0G 1H0
Carlisle Farm Robin Carlisle R.R. #4 Stirling, ON K0K 3E0	Clarion Swine Genetics Clare and Kent Martin R.R. #2 Drayton, ON N0G 1P0
Dietrich Farms Inc. Don and Paul Dietrich R.R. #1 Shakespeare, ON N0B 2P0	Dora Lee Genetics Ross and Betty Small R.R. #3 Harriston, ON N0G 1Z0
Haren Yorkshires Steve Zehr R.R. #1 Shakespeare, ON N0B 2P0	Ja-Viv Yorkshires Jack and Doug Nethercott R.R. #1 Arkona, ON N0M 1B0
Laurel Lee Acres Ltd Henry Groenestage R.R. #7, Orangeville, ON L9W 2Z3	Lone Willow Farm Bill and Sheila Collins R.R. #5 Kincardine, ON N2Z 2X6
Martinsheim Farm Richard Stroebel R.R. #2 Granton, ON N0M 1V0	Marwill Acres Reink Wiegersma R.R. #1 Bluevale, ON N0G 1G0

Ontario Swine Improvement	
Monoway Farms Wayne and Paul Fear R.R. #4 Brussels, ON N0G 1H0	Novastar Genetics John & Enid Gough R.R.#3, 7959 Falconbridge MT. Brydges, ON N0L 1W0
PSP Farm Genetics George Socket R.R. #3 Wingham, ON N0G 2W0	Ribanwood Yorkshires Bancroft, Peter R.R. #1 Newton, ON N0K 1R0
SGO Inc. Embro Division R.R. #3 Embro, ON N0J 1J0	SGO Inc. Goderich Div. R.R. #6 Goderich, ON N7A 3Y3
SGO Inc. Monkton Division Joe Kolkman R.R. #2, 6439 line 49 Logan Monkton, ON N0K 1P0	Stardobie Farm Doug and Rob McLeoed R.R. #5 Embro, ON N0J 1J0
Thames Bend Farms Ltd. Richard Stein R.R. #6 Woodstock, ON N4S 7W1	University of Guelph – Arkell Swine Research Tom Parker R.R. #2 Guelph, ON N1H 6H8
UPB Canada C. & J. Monden R.R. #5 Mitchell, ON N0K1N0	Vista Villa Farms Ltd. Bob and Scott Robinson R.R. #4 Walton, ON N0K 1Z0
West Lane Acres Wayne Brubacher R.R. #1 Wallenstein, ON N0B 2S0	

Western Swine Testing Association	
CAN-AM Genetics Inc. Box 278 Ookville, Manitoba R0H 0Y0	Lorne Penner PO Box 29C Ste. Anne, Manitoba R0A 1R0
Evergreen Colony Box 247 Oakville, Manitoba R0H 0Y0	Pembina Hog Farm General Delivery Darlingford, Manitoba R0G 0L0
Norquay Hog Farm Box 247 Oakville, Manitoba R0H 0Y0	Fast Pigs Inc. Box 903 Spiritwood, SK S0J 2M0
Genex Swine Group Tullymet	Acadia Breeders Ltd. R.R. #3 Lacombe, AB T0C 1S0
Bloomsbury Farms Ltd. General Delivery Bloomsbury, AB T0G 0G0	Five Lakes Farms Ltd. Box 537 Mayerthorpe, AB T0E 1N0
Horst & Linda Gollnick Box 95 Warburg, AB T0C 2T0	Huvenaars Farms Ltd. Box 142 Hays, Alberta T0K 1B0
Matejka Purebred Swine Box 779, R.R. #1 Sylvan Lake, AB T0M 1Z0	Morinville Colony R.R. #2 Morinville, AB T8R 1P5

Western Swine Testing Association	
Neufeld Farms Ltd. Box 105 Acme, AB T0M 0A0	Outlook Pork Box 186 Nobleford, AB T0L 1S0
Jurgen Preugschas Box 537 Mayerthorpe, AB T0E 1N0	PEAK Swine Genetics #217 - 5904B - 50 ST. Leduc, AB T9E 6J4
Rosebriar Farm Box 73 Alcomdale, AB T0G 0A0	Herman Simons R.R. #1 Tees, AB T0C 2N0
Avicolas de Alba Quinta Avenida No. 1001, Aquascalientes, Ags., Mexico	Venagen 688 Azucena Tlacuepacue Guadalajara, Mexico 45570

Appendix 10. Participating A.I. Centres

Alberta Swine Genetics Co. c/o Gregory Lebowa, Manager Box 3310 Leduc, AB T9E 6M1 Tel: (780) 986-1250 Fax: (780) 986-6523 Email: asgc@oanet.com	OSI Swine A.I. Centre P.O. Box 400 Innerkip, ON N0J 1M0 Tel: (519) 469-3010 Fax: (519) 469-8692 Email: mgingerich@osi.org www.osi-inc.on.ca
Centre d'I.A. du Québec a/s Ronald Drapeau 1486, rang St-Aimé Saint-Lambert, PQ G0S 2WO Tél: (418) 889-9748 Fax: (418) 889-8210 Email: cipq@istar.ca	Centre d'I.A. du Québec 2100, Rang 6 Roxton Falls, PQ J0H 1E0 Tél: (514) 375-9977 Fax: (514) 375-2077 Email: cipq@istar.ca
C.A.G.P. de Lanaudière Inc.. a/s Patrixce Dorion C.P.600 St-Jacques de Montcalm, PQ J0K 2R0 Tél: (450) 839-3131 Fax: (450) 839-2992 Email: info@cagp.com www.cagp.com	C.A.G.P. de l'Estrie Inc. a/s Cathy Brisebois C.P. 600 St-Jacques de Montcalm, PQ J0K 2R0 Tel: (450) 549-2121 Fax: (450) 549-6063 Email: info@cagp.com www.cagp.com
First Choice Genetics Richard Stein R.R. 6, Woodstock, ON N4S 7W1 Tel: (519) 655-2942 Fax: (519) 655-3404 Email: tbfarms@thamesbend.com www.thamesbend.com	Magnum Swine Genetics Box 1514 Fort Macleod, AB T0L 0Z0 Tel: (403) 553-4844 1-888-553-4844 Fax: (403) 553-4845 Email: sales@magnumswine.com www.magnumswine.com
National Swine Genetics 8817 Glengyle Drive Strathroy, ON N7G 3H3 Tel: (519) 245-6868 Fax: (519) 245-4884 Email: jmosborne@sgo.on.ca www.sgo.on.ca	P.E.I. Quality Swine A.I. c/o Bill Roloson R.R. #3, Belfast Ocean View, PE C0A 1A0 Tel: (902) 659-2883 Fax: (902) 659-2627 broloson@peiqualityswine.pe.ca www.peipork.pe.ca/quality/aiunit
C-Prim inc. a/s Yvon Desrosiers 2 chemin Saint-Gabriel Saint-Gabriel de Brandon, PQ J0K 2N0 Tél: (450) 756-5068 Fax: (450) 756-5068	Promagro A.I. Center Jorullo 1344 S.H. Guadalajara, Jalisco Mexico 44290 01-800-IA-MAGRO (42-6-24-70) promagro@prodigy.net.mx
Keystone Pig Advancement, Inc. Box 278, 101-2nd Street Oakville, MB R0H 0Y0 Tel: (204) 267-2813 Fax: (204) 267-2841 Email: kpa@mb.sympatico.ca www.kpapigs.com	