

Annual Report



2003

Annual Report 2003

BOARD OF DIRECTORS	3
CHIEF EXECUTIVE OFFICER'S REPORT	3
AUDITOR'S REPORT	4
COMPANY OVERVIEW.....	13
COMMUNICATIONS	13
ASRP MANURE CONFERENCE.....	14
RESEACH BARN	15
GREENHOUSE GAS MITIGATION PROJECT.....	16
OPTIMAL CARCASS WEIGHT QUESTION	17
COST OF PRODUCTION STUDY	18
TRACEABILITY	19
A DNA TECHNOLOGY TRIAL TO DEMONSTRATE THE IDENTITY PRESERVATION AND TRACEABILITY OF PIGS FROM FARM TO RETAIL.....	20
THE INFLUENCE OF SIRE TYPE ON THE PREVALENCE OF POSTWEANING MULTISYSTEMIC WASTING SYNDROME IN A COMMERCIAL PIG HERD.....	21
PRODUCTION AND ECONOMIC DIFFERENCES BETWEEN PIGS RAISED IN A DEEP BEDDED SYSTEM VS ON A FULLY SLATTED FLOOR.....	22
THE EFFECT ON PARTICLE SIZE ON FEED EFFICIENCY OF MARITIME MARKET HOG RATIONS.....	23
A PILOT STUDY COMPARING PURIFIED BETA GLUCAN TO COMMERCIAL VACCINES AND ADJUVANTS IN WEANED PIGS.....	24

Annual Report 2003

BOARD OF DIRECTORS

Chair	Dr. Trevor Lank	PEI
1 st Vice Chair	Ralph Mattie	Nova Scotia
2 nd Vice Chair	Fritz Othberg	New Brunswick
Secretary – Treasurer	John Jamieson	Staff

Director	Lloyd Evans	Nova Scotia
Director	Ian Mutch	PEI
Director	John Bos	New Brunswick

Ex-Officio

Henry Vissers	Executive Director	Pork Nova Scotia
Robert Harding	Executive Director	PEI Pork
Shelly Higgins	Executive Secretary	Porc NB Pork

Dr. Robert Gordon	Nova Scotia Agricultural College
Dr. David Burton	Nova Scotia Agricultural College

Dr. Daniel Hurnik	Chief Executive Officer
-------------------	-------------------------

CHIEF EXECUTIVE OFFICER'S REPORT

2003 was a growth year for the ASRP. It was the first full year of operations and I believe we have established the governance and structure to build on in coming years. Please read the financial statements and management letters provided by our auditors. We have taken the opportunity manage the UPEI research barn and this will give us a good place to do the kinds of research our producers need. Late in the year with the leadership of Dr Robert Gordon the ASRP has received funding to institute a Manure management research Chair at the Nova Scotia Agricultural College. This new position will create a dedicated manure research position for maritime producers. I believe we have an excellent beginning to bring the benefits of research to maritime hog producers.



Daniel Hurnik

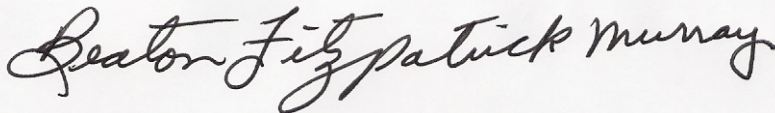
AUDITORS' REPORT

To the Members of The Atlantic Swine Research Partnership Inc.

We have audited the statement of financial position of The Atlantic Swine Research Partnership Inc. as at December 31, 2003 and the statements of operations and net assets and cash flows for the year then ended. These financial statements are the responsibility of the Organization's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the Organization as at December 31, 2003 and the results of its operations and the changes in its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.

A handwritten signature in black ink, reading "Beaton Fitzpatrick Murray". The signature is written in a cursive style and is centered within a light gray rectangular background.

Chartered Accountants

Charlottetown, P.E.I.

February 16, 2004

THE ATLANTIC SWINE RESEARCH PARTNERSHIP INC.

Statement of Financial Position

December 31, 2003

2003

Assets

Current assets:

Cash	\$	66,568
Accounts receivable (note 2)		83,453
Inventories		64,878
Prepaid expenses		15,000

\$ 229,899

Liabilities and Net Assets

Current liabilities:

Accounts payable and accrued liabilities	\$	69,379
Deferred revenue		80,404

149,783

Long-term debt (note 3) 80,113

Net assets:

Share capital (note 4)	3
Unrestricted	-

3

\$ 229,899

See accompanying notes to financial statements.

On Behalf of the Board:

_____ Director

_____ Director

THE ATLANTIC SWINE RESEARCH PARTNERSHIP INC.

Statement of Operations and Net Assets

Year ended December 31, 2003

	2003
Revenue:	
Swine chair funding (note 5)	\$ 120,145
Research project funding	153,005
Swine barn (page 7)	-
	<u>273,150</u>
Expenses:	
Dues and subscriptions	1,100
Interest and bank charges	23
Office	4,032
Professional fees	3,123
Research project expenses	192,617
Supplies	255
Telephone	3,922
Travel	7,688
Wages	60,390
	<u>273,150</u>
Excess of revenue over expenses	-
Net assets, end of year	\$ -

See accompanying notes to financial statements.

THE ATLANTIC SWINE RESEARCH PARTNERSHIP INC.

Statement of Cash Flows

Year ended December 31, 2003

	2003
<hr/>	
Cash flows from operating activities:	
Cash receipts from customers and funding agencies	\$ 270,101
Cash paid to suppliers and employees	(283,626)
Interest paid	(23)
	<hr/>
	(13,548)
Cash flows from financing and investing activities:	
Proceeds from long-term borrowings	80,113
Issue of capital stock	3
	<hr/>
	80,116
Net increase in cash	<hr/>
	66,568
Cash, beginning of year	-
Cash, end of year	<hr/>
	\$ 66,568
	<hr/>

See accompanying notes to financial statements.

THE ATLANTIC SWINE RESEARCH PARTNERSHIP INC.

Notes to Financial Statements

Year ended December 31, 2003

The Atlantic Swine Research Partnership Inc. is a not-for-profit scientific research corporation incorporated under the Canada Business Corporations Act. The Organization's principal activity is to conduct strategic scientific research activities for the development of the Atlantic Canada swine industry. The Organization is a not-for-profit organization under the Income Tax Act and accordingly is exempt from income taxes provided certain requirements of the Income Tax Act are met.

1. Significant accounting policies:

(a) Revenue recognition:

The Organization follows the deferral method of accounting for contributions which include government grants.

Operating profits are recorded as revenue in the period to which they relate. Grants approved but not received at the end of an accounting period are accrued. Where a portion of a grant relates to a future period, it is deferred and recognized as revenue in the subsequent period.

Unrestricted contributions are recognized as revenue when received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured.

Externally restricted contributions are recognized as revenue in the year in which the related expenses are recognized.

(b) Inventories:

Inventories are valued at the lower of cost and net realizable value.

(c) Financial instruments:

The Organization's financial instruments consist of cash, accounts receivable, accounts payable and accrued liabilities, deferred revenue and long-term debt. Unless otherwise noted, it is management's opinion that the Organization is not exposed to significant interest, currency or credit risks arising from these financial instruments. The fair values of these financial instruments approximate their carrying values, unless otherwise noted.

THE ATLANTIC SWINE RESEARCH PARTNERSHIP INC.

Notes to Financial Statements

Year ended December 31, 2003

1. Significant accounting policies (continued):

(d) Use of estimates:

The preparation of financial statements in accordance with Canadian generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities at the date of the financial statements, and the reported amounts of revenues and expenditures during the reporting period. Actual results could differ from management's best estimates as additional information becomes available in the future.

2. Accounts receivable:

	2003
Trade	\$ 82,005
G.S.T.	1,448
	\$ 83,453

3. Long-term debt:

	2003
Garden Province Meats Inc. promissory note, prime, repayments based on a levy of \$ 7.50 per hog sold to Garden Province Meats Inc. on an annual basis, due September 2008, secured by an assignment of fire insurance and all perils insurance and the inventory	\$ 80,113
	\$ 80,113

The aggregate maturities of long-term debt for each of the five years subsequent to December 31, 2003 are not determinable and therefore have not been disclosed.

THE ATLANTIC SWINE RESEARCH PARTNERSHIP INC.

Notes to Financial Statements

Year ended December 31, 2003

4. Share capital:

	2003
Authorized:	
Unlimited no par value common shares	
Unlimited no par value preferred shares	
Issued:	
3 common shares	\$ 3
	\$ 3

5. Swine chair revenue:

	2003
PEI Department of Agriculture	\$ 60,900
PEI Hog Commodity Marketing Board	37,500
Porc N.B. Pork	37,500
Pork Nova Scotia	37,500
Other swine chair revenue	10,855
Less amount of deferred revenue	(64,110)
	\$ 120,145

THE ATLANTIC SWINE RESEARCH PARTNERSHIP INC.

Schedule of Swine Barn Revenue and Expenses

Year ended December 31, 2003

	2003
Swine sales	\$ -
Expenses:	
Feed	29,906
Interest on long-term debt	763
Supplies	524
Swine purchases	28,912
Travel	373
Utilities	226
Wages	4,174
	<u>64,878</u>
Inventory adjustment	(64,878)
	<u>\$ -</u>

Annual Report 2003

AUDITOR'S REPORT

February 23, 2004

The Atlantic Swine Research Partnership Inc.
550 University Avenue
Charlottetown, PEI
C1A 4P3

Attention: Dr. Trevor Lank, Chairman

Dear Dr. Lank:

We have recently completed our examination of the financial statements of The Atlantic Swine Research Partnership Inc. (ASRP) for the year ended December 31, 2003. The purpose of this letter is to bring to your attention certain matters which were encountered in the course of our work and to offer our comments and recommendations. These comments, by their nature, are critical as they relate solely to weaknesses and do not address the many strong features and controls within ASRP's systems.

The primary purpose of our examination was to enable us to form an opinion on the financial statements of The Atlantic Swine Research Partnership Inc. for the year ended December 31, 2003. We reviewed and tested ASRP's financial systems and related internal controls to the extent we considered necessary to evaluate the systems as required by Canadian generally accepted auditing standards. Our study and evaluation with respect to these financial systems was not designed for the purpose of expressing an opinion on internal controls. It would not necessarily disclose all weaknesses in the systems.

To facilitate your review and follow up, a summary of the major findings is presented in the following paragraphs.

Income Tax Status

During our examination we noted that ASRP had been incorporated federally with share capital. This raises questions with regards to ASRP's status as a not-for-profit corporation exempt from income tax under the Income Tax Act. It is our understanding that it was always the intention to have ASRP structured to be a

Annual Report 2003

not-for-profit research organization. We recommend that this be addressed as soon as possible.

Project Cost Definition

Also during our examination we noted that the September 30, 2003 Board minutes state that projects greater than 10% over budget are to be brought to the attention of the board and treasurer. For increased clarity, the Board should define what expenditures are to be included in project costs.

Bank Deposits

It was noted during the examination that a deposit stamp was not being used to stamp the reverse side of cheques being deposited. We understand that a deposit stamp has been ordered. This will be a stronger control than the current procedure of endorsing the cheque with handwriting.

The contents of this letter have been discussed with the responsible management personnel and apply to the controls and procedures in existence during our examination. We have not reviewed these items since February 16, 2004, the date of our auditors' report. We would be pleased to discuss our comments and recommendations with you and to assist you with implementation.

This was the first year for an audit of ASRP, and we would like to acknowledge the professional manner in which the ASRP recordkeeping is conducted. We would also like to acknowledge the excellent co-operation and assistance extended to us by the personnel of ASRP during the course of our examination.

Yours truly,

Gerard J. Fitzpatrick, CA

GJF/jm

Annual Report 2003

COMPANY OVERVIEW

In the fall of 2002, representatives of the swine producer associations in the three Maritime Provinces incorporated a non-profit research corporation to conduct strategic research activities for the development of the Atlantic Canadian industry. The farmers have provided seed money to the company which will fund key strategic activities. As a private sector research corporation, it will have the capacity to leverage other funding sources; as well it will be able to issue research tax credits for eligible contributing partners.

The mission of the company is to empower Maritime swine producers to participate in the research and innovation needed to face present and future challenges. Each producer association has a one-third ownership in the company and elects two producers to the Board of Directors of the ASRP. The Board oversees all operations of the company and offers suggestions for research priorities and projects.

A producer's survey of research priorities was carried out in 2002, with the following as the key areas identified by Atlantic swine producers. The categories were similar for all regions and thus sent a clear signal of research direction. The top priorities were:

1. **Reducing Cost of production,**
2. **Nutrition with a key emphasis on reducing feed cost,**
3. **Herd Health, and**
4. **Environmental Management**

In the immediate future, the partnership plans to bring on stream a second research position for manure and environmental management. Manure disposal, nutrient management, and odour control have become significant factors affecting cost of production as well as eliciting community concern. The partnership will create a manure management research chair at the Nova Scotia Agricultural College. Additional core funding for this position has been secured from CARD funds from the three provinces as well as from the Province of Nova Scotia.

The partnership has initiated information technology processes to deliver the research findings to industry and community involving regular electronic transmission, newsletters, research seminars, and peer reviewed articles. So far response to completed projects has been positive enough to continue the flow of funds from industry to the partnership even through these times of severe economic pressure.

COMMUNICATIONS

For the ASRP to be relevant and meet the needs of producers there must be a continuous flow of information from the ASRP to producers. When the Boards of the three Maritime Provinces initiated the Atlantic Swine Research Partnership they identified communications as a priority. John Jamieson has been hired on a part-time basis to lead the ASRP communications strategy. The ASRP has initiated various communication strategies designed to keep producers abreast of current trends in the industry. These strategies involve electronic, written and oral communications to producers and the general public.

The ASRP has employed electronic communication tools to help keep producers up to date on developments in our industry. Electronic communication is effective as most maritime hog producers have access to the Internet and e-mail as well; it is a very cost effective communication tool. In 2003, the ASRP launched a daily e-newsletter that features market data, research articles and abstracts and current industry news. Much of the information contained in this daily newsletter comes from sources other than the ASRP and is structured to give producers a broader view of the industry. This newsletter is quite popular with

Annual Report 2003

over 300 producers, researchers, industry contacts and government personnel receiving it daily. The subscribers include not only maritime contacts but also include producers and researchers from every province in Canada along with contacts from the US, Brazil and the UK. The ASRP has also launched a website: www.asrp.ca. The website includes a searchable database where visitors to the site can search for articles on herd health, market analysis and general swine news. The site includes research papers from ASRP researchers as well as links to various interesting swine related sites.

The ASRP is also committed to communicating with producers in the newsletters of their local boards. We have submitted several articles in the past year to the board newsletters and plan to expand this coverage in 2004. The Board of the ASRP has also decided to publish a quarterly paper newsletter which will cover current and future research priorities, ASRP news and highlights from ASRP Board meetings with the first issue being published early April.

The Manure Conference held in August, 2003 is a good example of the obligation the ASRP has for oral communication. This conference was our first attempt to deliver a producer-oriented seminar with various speakers presenting on a common theme. The conference was well attended and lessons learned from this conference will help us deliver other conferences in the future. The conference also generated some very positive media exposure which is something our industry can always use. At producer meetings Dr. Hurnik has also made himself available to speak to producers on any topic the ASRP deals with.

The communications strategy engaged by the ASRP will continue to evolve to meet the needs of maritime hog producers. Any suggestions from producers to more fully develop our communication strategies are certainly appreciated.

ASRP MANURE CONFERENCE

The Atlantic Swine Research Partnership Inc. hosted a Summer Swine Research Symposium titled Focus on Manure on August 13-14, 2003 at the Atlantic Veterinary College, UPEI Campus, Charlottetown, PEI.

The event featured a one day conference followed by a half day field tour of the Agriculture and Agri-Food Canada Harrington Research Farm and the Atlantic Veterinary College Swine Production Facility. Speakers addressed a variety of subjects associated with manure use such as greenhouse gas emissions from pig production and carbon credits, the ASRP Greenhouse Gas Demonstration Project, odour and storage covers, nutrient fate and disease control from manure use, and precision application technologies.

The field tour allowed a first hand look at how some greenhouse gases are measured in the field from a variety of manure use experiments, demonstration of application equipment and a tour of the olfactometry lab where odour samples are processed.

A total of 60 participants attended the event from Prince Edward Island, New Brunswick, Nova Scotia, Newfoundland and Labrador, Quebec, Ontario, Manitoba and Iowa. Participants varied from researchers to soil and crop technicians and producers.

The symposium was sponsored by the Government of Canada Climate Change Action Fund (CCAF) through the Canadian Pork Council Greenhouse Gas Mitigation Program for Canadian Agriculture and Atlantic Swine Research Partnership Inc. Demonstration Project, and the Atlantic Veterinary College.

The presentations can be found on the ASRP web site at <http://www.asrp.ca/>

Annual Report 2003

RESEARCH BARN

In 1998, the University of Prince Edward Island built a 1000-head all-in/all-out finishing barn designed to accommodate swine and manure research. Because of changing priorities and the losses incurred from hog production the University decided to divest itself from the day-to-day management of the facility. The Atlantic Swine Research Partnership was approached by the University with a lease arrangement for this facility. The operation of the barn was assumed by the ASRP with the understanding that the barn pays for itself and with no assumption of liability (financial or otherwise) from the three Maritime Hog Boards.

This lease arrangement gives the ASRP access to a state of the art research facility with. We have negotiated a ten-year lease arrangement with a payment of \$ 5.00 per year to the University. The lease can be terminated by either party as long as notice is served at least one hundred and twenty days prior to the termination. The main requirements for the ASRP for the lease of the barn are as follows:

- Pay all appropriate taxes.
- To use the barn for the purpose of operating a swine research/production facility and conducting the business of ASRP Inc.
- Not to make any alteration to the barn which materially affects the well-being of the barn without the consent of the University.
- To maintain appropriate insurance of the barn.
- To provide access to the barn for researchers at the Atlantic Veterinary College, University of Prince Edward Island, and Agriculture and Agri-food Canada, and their students, to conduct teaching and research.
- To undertake responsibility for the Garden Province Meats Loan in the amount of \$ aprox. 75,000.

The barn is designed to accommodate 1000 pigs per fill with all-in/all-out group flow. The pigs are purchased from a single high-health source and enter the barn averaging approximately 42 pounds. The first fill of pigs under the ASRP entered the barn on Friday, November 14 with 898 pigs being delivered. We have been able to reduce the operating costs of the barn to come in line with the realities of hog production. In mid-February the pigs started going to market, and so far the costs have been in line with the projections.



Annual Report 2003

GREENHOUSE GAS MITIGATION PROJECT

For the 2003 season field work focused on participation with a number of projects. These included: Application of Liquid Swine Manure in Grass Forage, Application of Liquid vs. Solid Swine Manure, Liquid Manure in Conventional vs. No-Till Wheat, and Constructed Wetlands Treating Agricultural Wastewater. Participation included assistance with establishing trials and the collection of GHG, ammonia and odour samples. Negative Pressure Cover demonstration sites were established in Leicester, NS and Melrose, NB. Ammonia emissions monitoring was initiated at the Leicester site. This information will be utilized for validation of BMP's and development of extension materials.

Cooperated in field trials with SCIANS on injection of liquid swine manure and timing of fall applied manure. Work was conducted by PEISC with incorporation of swine manure. Attended SCIANS and NBSCIA GHG Field Day Tours. Discussions are taking place with the Soil and Crop Improvement Associations of the three Maritime Provinces for demonstration activities involving swine manure for the 2004 field season.

A producer survey was prepared and distributed through the provincial hog marketing boards. The data is currently being analyzed and results are expected to give the current picture of activities occurring in the Atlantic region with respect to GHG mitigation.

A poster display and handouts for ASRP GHGMP were prepared. These items were utilized at the Maritime Fall Fair, Maritime Pork Conference, the Nova Scotia Federation of Agriculture AGM, and the GHGMP Planning and BMP Workshop in Moncton. Articles relating to GHG BMP's were submitted to Farm Focus, Island Farmer and Rural Delivery periodicals. A web site and associated extension materials are being developed.

A variety of training courses were attended which included media training, web site development, and Nutrient Management Planner Training. A presentation was made at the ASRP Manure Symposium "Focus on Manure" in PEI. A tour of GHG activities associated with the ASRP GHG Program was hosted following this conference. A presentation was made on the ASRP program at the GHGMP Planning and BMP Workshop in Moncton.

Investigative travel activities took the Demonstration Coordinator and a producer to Denmark for the European Biogas Workshop. A report has been prepared and a presentation made to the NSFA Renewable Energy Committee. Preparations have been made for further investigative travel to the EPA AgSTAR Biogas Conference and producer attendance at the Integrated Solutions to Manure Management II Workshop.

Additional project proposals have been prepared and submitted pertaining to biogas feasibility studies and manure storage cover technology. These projects will expand on demonstration activities associated with the ASRP program.

Respectfully submitted,

Rick Hoeg, GHG Demonstration Coordinator ASRP

Annual Report 2003

OPTIMAL CARCASS WEIGHT QUESTION

Question :

What are the cost and benefits of going to a higher carcass weight, and does it pay to do so?

Conventional thought indicates that it does, as the industry has continued to increase weights. Higher carcass weights increase throughput of the packing plant and thus reduce processing cost per pig. Assuming there are sufficient rewards for the producer, it should pay the producer increase marking weights. A request was made to the ASRP for a more detailed assessment of this assumption. A preliminary scan of the literature indicated the following:

- There are differences in animal performance as slaughter weights increase. The most recent information indicates an increase in feed conversion and a slight decrease in carcass lean yield
- There appears to be no problem in pork quality and taste as the carcass is larger
- Quite clearly there is more time needed in the barn, which would increase housing costs per pig

Intuitively, as feed prices change and pig prices change the benefits of higher carcass weights should change. It is reasonable to suggest that during times of higher pig prices and lower feed costs, it should pay to increase carcass weights, on the other hand low pig prices and high feed costs may show that higher carcass weights do not benefit the producer.

The impacts of the above factors can be predicted using the known information combined with research estimates from existing data. A prediction model has been made available on the ASRP website at www.asrp.ca. The assumptions of the model are as follows:

1. feed conversion changes due to carcass weight are as published by per Pieterse.
2. Lean yield changes associated with carcass weight are from the ASRP pig barn database
3. Price is adjustable by producer
4. Grid is adjustable by producer
5. Housing cost is \$0.10 per pig per day and adjustable to meet individual producer's costs
6. Growth rate of gilts is adjustable by producer
7. Growth rates of barrows is adjustable by producer
8. revenue calculations are from 20kg to various market weights
9. Dressing percentage is set at 80%.

Work still required in making the model more precise:

- Verify feed conversion data with local data
- Verify lean yield data with larger data from other farms and genotypes.

The model compares different carcass weights on an individual basis and as well a barn basis where when a larger carcass weight would reduce the number of pigs sold.

It is important to realize the model is a prediction only, and results may vary by farm, health status and genetics of the pigs. It is meant as a guide to help producers consider decisions regarding choosing an optimal carcass weight.

Annual Report 2003

COST OF PRODUCTION STUDY

TERMS OF REFERENCE

The maritime pork industry generated combined farm cash receipts of almost \$90 million in 2002, on hog marketing of 620,000 hogs. It is a vital contributor to the rural economies of the Maritime Provinces. The loss of provincial programs that support the industry has resulted in financial hardship for many producers.

The pork industry in the Maritimes through our research organization Atlantic Swine Research Partnership is interested in looking at a cost of production study that will provide both benchmarking capabilities and suggest improvement for producers and therefore improve the viability of pork production in the Maritimes. This project has been approved and scheduled for completion in the summer of 2004

OBJECTIVES

The industry cannot develop competitive strategies unless we know our actual costs. Each of the provinces has, to some degree, attempted to develop a COP model however a comprehensive Maritime model with some provincial variance will give producers, industry stakeholders and government a credible guide to costs of production in the Maritimes. This guide is crucial for program development as we attempt to develop strategies that make our industry sustainable.

1. Evaluate a cross section of farms in order to develop a COP
 - Look at owner withdrawals and hired wages
 - Review financial ratios
 - Give a high/low range for costs
 - Provide average feed conversion
 - Cost per hog for feed and other variable and fixed expenses
2. Evaluate impact of safety net programs
 - Impact of existing programs
 - Impact of new APF Business Risk Management model
3. Review feed costs in each of the three provinces
4. Develop a COP model that can be updated quarterly
 - Analysis the profitability for the past 5 years
 - Provide a model template an individual farm can use
 - Identify sources of information for updates i.e. feed cos
 - Provide achievable benchmark goals

Annual Report 2003

TRACEABILITY

The diagnosis of bovine spongiform encephalopathy (BSE) in Canada has heightened awareness of potential animal health risks facing livestock producers. Foreign animal disease fears are fuelling the fire for national animal identification systems and movement traceability for livestock.

The Canadian Pork Council is determined to have a system in place within two years that will allow authorities to track the movement of all hogs produced in Canada. Recently, the CPC has approved a series of pilot studies designed to test and establish guidelines for a national swine traceability program. These studies will test a number of permanent identification systems such as the slap tattoo and ear tags that are currently used. In addition, radio frequency identification systems that involve permanent id tags will also be tested.

The Atlantic Swine Research Partnership, on behalf of Maritime pork producers, insisted that group or lot identification be tested as an alternative to permanent id systems. The CPC Traceability Technical Committee has approved the inclusion of group/lot id as a scenario in the pilot studies.

In developing a traceability pilot study the ASRP Board felt that the system must meet the following objectives:

- Simple
- Inexpensive
- Easy to administer
- Little or no operational costs to producers

The CPC will conduct pilot studies in 3 Canadian regions: PEI, Manitoba and Quebec. The ASRP portion will involve up to 20 producers who volunteer for the pilot project. The project will synchronize records from existing farm production, slaughter plant and marketing boards. The farms will then enroll in a 6 month project where all pig movements will be tracked through a prototype database with each group/lot of pigs given an identification number. This group/lot id will be used to verify pig movement and farm inventories.

At the conclusion of the pilot study we expect to have a statistically valid evaluation of using group/lot identification as a possible strategy for a national hog identification system. It is also expected that we will develop a working database that can be expanded for national implementation.

Recently, the ASRP was awarded a contract to provide technical services to the Canadian Pork Council for the series of permanent id pilot traceability studies. We have identified farmers in PEI and New Brunswick who have agreed to test and evaluate the different traceability scenarios that are identified in the pilot study. ASRP technicians will visit these farms and assist the farmers who are testing the technology. Comments regarding the practicality of the different scenarios will be collected by the technicians and presented to the Canadian Pork Council. This gives producers in the Maritimes an opportunity to be involved in the type of pig traceability system that will be implemented in Canada.

Annual Report 2003

A DNA TECHNOLOGY TRIAL TO DEMONSTRATE THE IDENTITY PRESERVATION AND TRACEABILITY OF PIGS FROM FARM TO RETAIL

D. Hurnik³, K. A. MacDonald³, S. H. Morris*¹, R. Loftus², C. Scott², W. Andrews⁴, K. Coffin¹, B. Cudmore⁴, R. Harding⁴, P. Horne³, J. Jamieson⁴, P. Jenkins⁵, M. Morrison¹, T. Seeber⁶ & D. Thompson⁷

¹Canadian Food Inspection Agency (CFIA), Ottawa, Canada

²IdentiGEN, Institute of Genetics, Trinity College Dublin, Ireland

³ASRP, Atlantic Veterinary College, University of Prince Edward Island, PEI, Canada

⁴PEI Pork, Charlottetown, PEI, Canada

⁵Prince Edward Island Department of Agriculture and Forestry, Charlottetown, PEI, Canada

⁶Garden Province Meats Inc., Charlottetown, PEI, Canada

⁷FoodTrust of Prince Edward Island, Charlottetown, PEI, Canada

Implications of DNA traceback technology success in this project:

- the Biotag™ has proven reliable with >99.9% confidence
- the primal cut samples obtained in the cutting room clearly establishes the ability of DNA traceback technology to identify the source animal of cut pork products through the use of the Biotag™, or to farm of origin using the carcass tattoo
- in the cutting room where the farm and animal identity is lost, DNA technology can identify the source carcass
- success of retail traceback was also demonstrated to the animal and farm of origin
- DNA technology correctly identified a loin in the branded production line that originated from an unbranded carcass
- without DNA technology there is no way to identify this product

In conclusion, there is definite potential for DNA TraceBack™ technology in tracking pork cuts from supermarket to the source animal and farm for livestock. This technology allows for an immediate industry response to any level of potential complication in the market place, slaughter plant, or farm. It also allows regulatory veterinarians to play a more intricately targeted role thus increasing the safety level of public protection against disease and bio-terrorism with minimal financial implications. Currently, there is no mandatory implemented safety traceability program post-slaughter and with the demonstrated efficacy of the DNA traceback process (with its calculated percentages clearly indicating the success in correlating the meat product sampled at the retail level to both source farm and animal) there is definitely a sufficient rationale to implement this safety feature in the current market environment.



Annual Report 2003

THE INFLUENCE OF SIRE TYPE ON THE PREVALENCE OF POSTWEANING MULTISYSTEMIC WASTING SYNDROME IN A COMMERCIAL PIG HERD

Daniel Hurnik, ASRP

The objective of this study was to investigate the hypothesis that, following stimulation of the immune system with an adjuvant in pigs naturally infected with PCV2, different breeds of swine may have inherent resistance to the manifestation of PWMS.

- There was only 1 case of PMWS in this study, it was a pig treated with adjuvant and there were no cases in the controls. The overall rate of PMWS in this fill as low, this was the only case recorded. It is not possible to draw conclusions whether sire choice influenced the rate of PMWS, because there was only one case. The case occurred in the adjuvant treated pigs, and was from a Yorkshire sired pig.
- The adjuvant had no significant impact on growth rate, but the choice of sire did. This verifies that the genetic potential of the sire has a significant impact on his progeny in a commercial setting
- There was no difference in feed conversion between the pigs that were given adjuvant and the control pigs.
- There was no impact of the use of adjuvant on either the carcass index or the lean yield. Only carcass weight was a significant factor.
- The use of an adjuvant had no impact on backfat or muscling depth. Again, carcass weight had a significant impact. There was a trend towards a smaller loin eye size (muscling) with the use of the adjuvant. While the probability had a p value of .110, the magnitude of the change was high. This should perhaps be examined again.

Annual Report 2003

PRODUCTION AND ECONOMIC DIFFERENCES BETWEEN PIGS RAISED IN A DEEP BEDDED SYSTEM VS ON A FULLY SLATTED FLOOR

D Hurnik^{1,2}, S Whyte¹, T Van Lunen,² J MacLeod,² A Campbell,²
¹ASRP Inc, ²Agriculture Agri-Food Canada, Charlottetown, Canada

This study compared growing pigs in a deep bedding-solid manure system to a fully slatted, liquid manure system in a modern, environmentally controlled facility on Prince Edward Island, Canada. While production data was collected for both liquid and solid manure systems, the study was performed under one roof where genotype and management were uniform. The study data spans from July, 2000 to July, 2002 incorporating information for 6 production groups which includes up to 4,951 animals.

MATERIALS AND METHODS

For each production period, approximately 900 pigs, each with a average starting weight of 22 kg, were held in pens of 20 to 25 animals per pen and distributed throughout the slatted concrete area and deep bedded area of the facility, located on the Union Road in Prince Edward Island. The pigs were weighed at the initiation of the study period and on leaving the barn at market weight (107-112 kg), blood sampling for disease prevalence occurred at shipping weight. The feed conversion was calculated on a pen basis. All the animals were graded at slaughter for lean content using a commercial pork grading probe (Destron PG100)

Manure was removed from each pen on the solid bedding and liquid systems midway through the production period and all manure from each pen was removed at the end of the trial once all the animals had been shipped to market.

RESULTS AND DISCUSSION

Crude Mortality and Morbidity

	Slatted	Bedded	P (Chi ²)
Mortality	121	119	0.14
Morbidity	167	145	0.59
Unaffected	2723	2228	

Life time *Salmonella* sp Exposure

Status	Slatted	Bedded	P (Chi ²)
Positive	1	7	0.02
Suspicious	4	15	0.00
Negative	85	65	

Feed Conversion Ratio (pens)

Bedded	2.89
Full slatted	2.91
N	103
	P = 0.55

Growth Rate g/day

Group	Bedding	Slatted	P	N	Season
8	868	833	0.04	865	Spring
9	857	908	0.00	681	Summer
10	848	840	0.40	875	Winter
11	866	870	0.64	905	Spring

Carcass Evaluation at Slaughter

	Bedding	Slatted	P	N
Backfat (mm)	20.1	18.4	0.00	589
Loin (mm)	58.7	57.7	0.16	589
Lean (%)	59.89	60.33	0.10	589

Air Ammonia (ppm) Concentration in winter

	Slatted	Bedding
9 January 2001	5.83	3.26
10 January 2001	4.15	9.95
11 January 2001	4.41	16.5
5 January 2001	15.61	34.11
1 February 2001	15.4	27.74

Manure Disposal Costs/ 500 pigs

	Slatted	Bedding
Personnel	\$1792.00	\$3318.00
Equipment rental	\$662.00	\$4003.50
Bedding Costs		\$2640.00
total	\$2454.00	\$9961.5

SUMMARY

- Pigs raised on a Deep bedded system had the same rate of disease and mortality as pigs on a fully slatted system.
- Pigs raised on a deep bedded system had a higher lifetime prevalence of salmonella exposure than pigs on a fully slatted flooring system.
- The growth rate did not differ among pigs raised on a deep bedded system compared to on full slatted, except for in the summer where the bedded pigs grew slower.
- There was no difference in Feed Conversion detected between pigs on a bedded system compared to a fully slatted floor.
- Pigs that grew up on a bedded floor had more backfat than those from a fully slatted floor, which resulted in slightly lower carcass premiums.
- Nitrogen retention of the manure was lower in a bedded system than in a liquid manure system, primarily due to higher airborne ammonia losses from the solid manure pack. Air ammonia levels were higher in the bedded portion of the barn
- The operating costs of a bedded system was significantly higher primarily due to bedding costs and increased labour costs associated with manure storage and removal.

Annual Report 2003

THE EFFECT ON PARTICLE SIZE ON FEED EFFICIENCY OF MARITIME MARKET HOG RATIONS

D Hurnik, ASRP

Background

long been an association between particle size of the feed and efficiency of pig growth¹. Most of the research has been on corn or wheat diets. Relatively little work in this field had been performed with grains more commonly used in Atlantic Canada. Previous pigs fed using feeds of particle size has given indicated that particle size and size of screen used may impact on feed efficiency. Earlier findings were based on equal diets at different times, so factors besides particle size cannot be ruled out. If the findings are based on feed grind the magnitude of change is very significant for Maritime Producers. For this reason we performed a specific trial to look at particle size.



Materials and Methods

450 pigs balanced by gender and in both the slatted and bedded portion of the barn were fed each of the following diets. the fill of pigs ran from July 2003 to October 2003

Grind (Particle size)	Screen size	Ration
Fine	8/64ths 1/8ths	Barley, Rye, whole soybeans, premix
Medium	12/64ths 3/16ths	Barley, Rye, Whole soybeans, Premix
Coarse	24/64ths 3/8ths	Barley, Rye, Whole Soybeans, Premix

Results

	Fine	Medium	Coarse	Gilts	Barrows	Slatted Floor	Bedding
Days to Market (from 25kg)	101.7	102.5	103.8	103.8	99.2	101.5	101.8
ADG kg/d	.860	.861	.857	.836	.892	.860	.864
Feed Conversion	2.98	2.97	2.98	2.96	3.05	2.94	3.08
Index %	109.3	109.5	109.7	110.3	108.6	110.1	107.9
Lean yield mm	59.87	60.13	59.92	59.4	60.4	60.1	59.5
Backfat mm	20.2	19.6	20.0	18.88	21.1	19.5	21.1
Loin eye mm	58.8	59.9	58.5	58.52	59.67	58.8	59.6

Conclusions

This study found that particle size as defined by size of the screen used to grind the feed had only a small effect of the performance of the pigs. Pigs fed a coarse ration grew slightly slower than pigs fed a diet made with 3/16th and 1/8th screens. There was no effect of particle size on feed conversion or carcass quality. The feed made with a 1/8th screen, was more likely to bridge in both the feed bins and the feeders.

The major effects in this study were as a result of the gender of the pig and the use of bedding for the pigs. Gilts grew slower and were significantly leaner than barrows. This is a consistent finding in all studies. In this fill of pigs, the use of bedding resulted in significantly fatter pigs at market, and a significantly lower index. This is also consistent with earlier fills of pigs raised on a bedded system.

Annual Report 2003

A PILOT STUDY COMPARING PURIFIED BETA GLUCAN TO COMMERCIAL VACCINES AND ADJUVANTS IN WEANED PIGS

D. Hurnik¹ R. Vanderstichel¹ P. Hanna¹ J. Haruna¹ T. VanLunen, K. Foote, Patelakis²
¹ASRP Inc, University of Prince Edward Island ²Progressive Bioactives, Charlottetown, Canada

INTRODUCTION

Immunomodulation is currently being explored in pigs as an alternative to routine use of antimicrobials. Beta-Glucan, a polymer of D-glucose, has been shown to have many potential properties². Human macrophages, neutrophils and Natural Killer cells have two known specific receptors for β -Glucan. The dosage of beta-glucan appears to be a critical factor in its application and the effect varies by source and purity. Currently, there is a limited amount of information about the effects of β -Glucan in pigs. This study compared the use of a purified Beta Glucan (PBG) to a commercial vaccine and adjuvants.

MATERIALS AND METHODS

The project involved 60 pigs beginning at 3 weeks of age and lasted for 5 weeks. There were 11 treatments utilizing pigs each in pens of two. An injection of saline served as a control, and an injection of a live PRRS attenuated vaccine was given with 0, 40, 80, & 120 g/tonne of PBG in the feed of feed.

These treatments were compared to multiple injections of an aluminum hydroxide adjuvant, and either a single or double injection of an oil based adjuvant. Pigs were housed in pens of two. Blood samples were taken from the anterior vena cava at day 7, 21 and 35 of the study. The PRRS virus antibodies were quantified using the IDEXX PRRS elisa test kit.

Immunohistochemistry staining for PCV-2 in the lymphoid tissue of the injected pigs looked for the presence of PCV-2. The results were analysed statistically using Linear regression in a mixed model where either the pen or pig (in repeated measures) was controlled as a random effect.

RESULTS

Growth Rate	g/day	S.E.	
control	436	21	a
PBG 40 mg/kg	425	25	a
PBG 80 mg/kg	390	25	a
PBG 120 mg/kg	418	22	a
Al(OH) adjuvant	397	25	a
Oil adjuvant one dose	415	25	a
Oil adjuvant two dose	275	26	b
PRRSv Control	363	22	c
PRRSv @ PBG 40 mg/kg	400	21	a,c
PRRSv@ PBG 80 mg/kg	428	22	a
PRRSv @ PBG 120 mg/kg	362	21	c
Feed Conversion	F:G	S.E.	
Control	1.626	0.044	a
PBG 40 mg/kg	1.618	0.054	a
PBG 80 mg/kg	1.773	0.053	b
PBG 120 mg/kg	1.607	0.047	a

Al(OH) adjuvant	1.735	0.053	b
Oil adjuvant one dose	1.779	0.053	b
Oil adjuvant two dose	2.010	0.055	c
PRRSv Control	1.735	0.046	b
PRRSv @ PBG 40 mg/kg	1.655	0.045	a,b
PRRSv@ PBG 80 mg/kg	1.716	0.046	a,b
PRRSv @ PBG 120 mg/kg	1.653	0.045	a,b

PRRS Antibody Response (Elisa)

Treatment	S/P ratio	SE	
Control	1.49	0.18	a
PRRSv @ PBG 40 mg/kg	1.62	0.18	a
PRRSv@ PBG 80 mg/kg	2.20	0.18	b
PRRSv @ PBG 120 mg/kg	1.26	0.22	a

PCV-2 Immunohistochemistry

PCV-2	Al(OH)	Saline	Oil	PRRSv
negative	3	8	7	9
positive	1	1	5	1

DISCUSSION

It appears purified Beta-Glucan may have a significant impact on weaned pigs. This pilot study had the following findings that warrant further study:

- Two doses of oil adjuvant and live virus injections may negatively impact the growth rate and feed conversion of weaned pigs,
- Purified Beta Glucan may reduce some of the vaccine associated growth reduction at a dose of 80 mg/kg of feed,
- Purified Beta Glucan may increase the antibody response to live virus vaccination at a dose of 80 mg/kg of feed,
- None of the immunomodulators caused the development of any lesions associated with PMWS,
- There was a trend in Oil based adjuvants to increase the presence of PCV-2 in tonsillar tissue

¹ Wondra et al, Effects of mill type and particle size uniformity on growth performance, nutrient digestibility, and stomach morphology in finishing pigs. J Anim Sci. 1995 Sep;73(9):2564-73.

² Bohn JA, BeMiller JN. (1-3)- β -D_ Carbohydrate Polymers 28(1995):3-14