VIDO

1996/97 ANNUAL REPORT

BOARD OF DIRECTORS

1996-97 VIDO BOARD MEMBERS
(FROM LEFT TO RIGHT)

BACK ROW
DALE ARMSTRONG, PETER REMPEL, ALEX LIVINGSTON,
DENNIS BILLO, IAN THOMPSON, BOB HUNSBERGER

FRONT ROW
DEBORAH STARK, FRED VAN INGEN, DEBORAH WHALE,
DENNIS JOHNSON, LORNE BABIUK

MISSING
MONTY LITTLE

mandate

To Serve the Canadian Livestock and Poultry Industry by:

Conducting animal health related research

Communicating livestock management techniques and information

Facilitating the transfer of technology for international commercial development

goals of vido

To serve and assist the economic competitiveness of the livestock industry through research on the common infectious diseases of animals and poultry.

To provide information leading to safe and effective animal health preventive medicine programs which enhance animal care through improved management and performance of livestock.

To identify opportunities to utilize VIDO's livestock research to improve human and companion animal health.

To maximize funding by enhanced visibility and development of innovative communication programs with all organizations that provide support to VIDO.

To transfer technology to the biological industry to enhance its commercial application for the benefit of the Canadian livestock producers and to provide financial stability to VIDO.

To manage its financial, educational, and human resource efforts to ensure long-term benefits to the organization's stakeholders.

CHAIR'S REPORT

Deborah Whale
Chair

Fred van Ingen
Vice-Chair

VIDO will remember 1997 as a year of exciting technological achievement, and excellent business opportunities. It was also the year of new core funding, a new member on the management team, and a renewed board committee structure geared to assessing VIDO's "return on investment".

VIDO represents a substantial investment on the part of many in the Canadian livestock sector, in various levels of government, and within the Organization itself. Therefore, VIDO has to provide a reasonable return on this investment to its various stakeholders. Over the past year, our management, scientists, staff and board members have worked very diligently to ensure that VIDO, the business, will continue to succeed and to produce results for the livestock sector.

The Director, Dr. Lorne Babiuk, one of Canada's most illustrious scientists, has signed a new five-year contract with VIDO. VIDO also welcomed a very talented and committed new Associate Director of Marketing and Business Development, Dr. Norm Habermehl. They, along with the renowned Dr. Andrew Potter as Associate Director of Science, form the Executive Management Team.

A new Succession Plan now encourages all the scientists employed with VIDO to develop their skill levels in science, administration, communication, and team work, and to move into more senior positions if they choose. The Succession Plan will encourage VIDO scientists to remain with VIDO and to continue to build the strong, interactive team needed to develop quality technologies.

The Board of Directors has streamlined its committee structure to put more emphasis on evaluating VIDO's business results. This would include an assessment of research achievements and priorities; of VIDO's success in finding project funding and commercial partners; and of time lines and product deliverables.

Saskatchewan Economic Development is investing $500,000 per year for four years to crucial core funding for VIDO. This is the overhead money that is in such short supply in these days of government cutbacks, and which will enable VIDO to hire additional scientists to do the research that determines our technological success.

As of January 1997, VIDO began dealing with BIOSTAR Inc. as it does with any other technology development company, and will not allow VIDO's technology or products to become encumbered by BIOSTAR. VIDO will choose its commercial partners solely on the basis of what is the best business decision.

In 1997, VIDO scientists were working on a number of leading edge technologies including the development of a comprehensive vaccine for bovine mastitis due to contagious and environmental bacteria; a recombinant subunit vaccine for the prevention of hemophilosis infection in cattle; novel subunit vaccines to control *Streptococcus suis* infection in swine; an oral vaccine for the prevention of *E. coli* infection in poultry; a recombinant vaccine for the prevention of calf scours caused by rotavirus and coronavirus. VIDO has a project to develop DNA immunization technology in food-producing animals; a project to develop an accurate test to detect disease in an animal before clinical signs are present; and a project to assess the potential of adenovirus vaccine vectors for the induction of mucosal immunity.

VIDO has research/product development contracts signed with a number of large commercial pharmaceutical companies, and the World Health Organization, and currently has two new products in the final stages of requesting government approval for licensing.

Most definitely, VIDO is making important contributions to the entire Canadian livestock industry in several ways. Not only does VIDO develop the vaccines which prevent disease in livestock, but its research ensures that consumers are eating meat from animals which are resistant to disease and therefore free of chemical residues. This is crucial in an era of increasing emphasis on food safety. Also, improved animal health is a positive animal welfare issue, making Canadian meat more competitive both domestically and internationally.

VIDO is truly a great Canadian resource and has firmly established itself as a good place to do research and good place to do business.

DIRECTOR'S REPORT

When VIDO was established in 1975, its mandate was to investigate the common infectious diseases of food producing animals. At that time, VIDO was using only conventional technologies to address the important issues of diagnosis and vaccine production. Furthermore, the funding was primarily from government sources. As VIDO grew and governments were faced with deficits, VIDO needed to identify new sources of revenue not only for its survival, but also for its growth if it was to achieve its mandate. Fortunately, through VIDO's continued vision and willingness to adapt and capitalize on opportunities, VIDO has been able to grow in an era of financial constraints. For example, VIDO was one of the first institutions to recognize the importance of biotechnology and its use for developing new prophylactic and diagnostic tools for the livestock industry. As a result, VIDO was the first organization in the world to develop a genetically engineered vaccine for animals. In addition to rapidly adapting new technologies to solve relevant problems, VIDO has also recognized the need to be relevant to its stakeholders. Indeed, this has been one of the hallmarks of VIDO's success – recognizing the future and strategically positioning itself to capitalize on global events. Sometimes this was difficult because being a leader requires convincing people that change is necessary. VIDO is committed to "plowing new furrows". As part of our continuing evolution, VIDO is developing relationships with Canadian and multi-national biopharmaceutical companies as well as international research institutes to help exploit VIDO's discoveries, and to acquire new technologies for the continued benefit of VIDO and indirectly for the livestock producers. Originally, VIDO used to develop a product and then attempt to transfer it to a company for manufacturing and marketing. Although this was successful we need to enter the market place faster in the future. To achieve this, VIDO is establishing relationships with companies early in the research process, where the marketing company can perform all of the market surveys and identify the most appropriate product to meet the market needs. VIDO will then do the research which can be focused at

Lorne Babiuk - Director

producing the products and transferring them to the market place with minimal delay. This approach will help VIDO expedite the delivery of its products to the market and the partnerships established will help fund the research at VIDO. Thus VIDO is not only building on past partnerships with the primary producers, but also extending them to the biopharmaceutical industry and governments.

For any organization to succeed, it is critical to have funding to ensure the infrastructure is in place to respond to opportunities as well as to maintain the operations of a complex research institute. Unfortunately, most funding organizations and companies continue to only provide project-specific funding with no, or limited funding for infrastructure. To partially address this issue, VIDO has worked with the Department of Economic Development of the Province of Saskatchewan, who has agreed to provide $500,000.00/year over a 4-year period for operations. This is the first time in VIDO's history that we have obtained significant funding for infrastructure support. This funding will dramatically influence our ability to enter into agreements with commercial companies and foreign research institutes as well as to respond to industry's needs. During the coming year, we will focus on developing partnerships with the Federal Government as well. We feel that a partnership between the Federal Government, the Provincial Governments of Canada, and VIDO is an excellent way to help governments achieve their stated goal of increasing economic activity, creation of jobs, and training people for the knowledge-based industries of the next millennium. Thus, VIDO is establishing strong linkages with Provincial governments, the Federal government, primary producers, biopharmaceutical industries, and foreign governments to ensure the most efficient use of resources and addressing the most important needs of all the constituencies VIDO serves.

As VIDO continues to evolve, I must recognize individuals that have helped us achieve this goal. This includes the staff of VIDO who work countless hours, beyond the call of duty, to finish that "*key experiment*" that gives our team the ammunition to maintain financial and moral support from our stakeholders. In addition to the staff, the continued support of many individuals throughout the industry who have offered both financial support as well as constructive criticism is appreciated.

I would also like to acknowledge the VIDO Board of Directors, who have provided tremendous support to our Organization over the past year and have worked very closely with the Management Team to obtain funding from the Province of Saskatchewan. The Board of Directors' support and especially that of Deborah Whale, the Chair of the Board, who spent an inordinate amount of time improving Board performance and re-organizing the Committee structure, is also appreciated. These changes will help position VIDO to be a much stronger Organization and one which will be able to respond better and faster to the needs of our clients.

MARKETING REPORT

Theme: Evolution of An Organization

"In today's business environment, more than any preceding era, the only constant is change."

Robert Waterman

This statement was made more than 10 years ago, but the adage remains; "change" is a constant companion in the evolution of man and society. Change impacts our entire socio-economic system, re-engineering the institutions that form society's foundation. The food-animal/animal-protein industries are rapidly evolving to meet the challenges and opportunities presented by our changing times.

Horizontal integration has led to the industry being comprised of fewer but larger participants. Consolidation of farms, food processors, bio-pharmaceutical companies and feed companies proceed as these participants strive for economies of scale in the production, processing, marketing and distribution of animal protein products.

Vertical integration (through strategic alliances, collaborative integration and/or acquisitions) is becoming the norm as participants in the supply-chain seek seamless transfer of information, security of product supply, consistency in quality and a guaranteed market for their products. This integration has led to the adoption of "value-based marketing", information based management systems and HACCP (Hazard Analysis and Critical Control Point) quality assurance systems. These advances will lead to greater equity in profitability distribution along the supply-chain, enhanced risk management, and increased cooperation amongst the chain members in the production, marketing and distribution of products.

Market globalization and movements towards freer international trade (GATT/WTO/NAFTA) will continue to change the environment within which this industry operates. Once a regionally focused, domestic industry, Canada's red meat industry has rapidly evolved into an

"In change there is opportunity and challenge."

Clifton Garvin

industry with a global focus; transforming itself to meet the challenges and opportunities afforded to exporters. Exports to the USA and the Pacific Rim accounted for 18% of our domestic beef production in 1981. In 1996, these markets consumed 54% of our national production. Canada's reputation for safe, high-quality products has positioned our food-animal/animal-protein industries in an enviable, competitive position in the global market place.

Government intervention in these industries has and continues to be reduced, shifting the drivers of the industry. International trade negotiations have called for greater transparency in trade and the removal of tariffs, government agricultural subsidies and sanitary/phytosanitary non-tariff trade barriers. The abolition of the Crow Rate freight subsidy has refocused the western Canadian agricultural community on livestock production and "value-adding" to the grain that had previously been exported as a raw commodity.

Finally, the consumer has evolved into a proactive, decision-maker in the chain, a participant who is prepared to exercise her/his individual and collective power in defining the quality and attributes desired in the products he/she consumes. Consumers of the 90's have demonstrated a preference for quality, consistency, convenience, wholesomeness and safety; and at an affordable price. Increasingly health conscious, today's consumer is demanding leaner meats, lower fat dairy products, and has expressed a desire to be informed relative to the composition and production of the food they consume.

Over the past 25 years, the food-animal/animal-protein industry's focus has evolved from that of a fragmented, regional, undifferentiated commodity provider to an efficient, low-cost provider of differentiated, quality products. This evolutionary process continues as the industry recognizes that organizational and industry goals will best be achieved through the identification of the needs/wants of their target market(s). Delivering the desired product(s) in an effective, efficient manner requires the collaborative efforts of all links in the supply/value chain.

Norman Habermehl
Associate Director of Marketing & Business Development

Established in 1975 and mandated to serve the livestock and poultry industry, VIDO has evolved in a similar fashion. VIDO's research has evolved from a focus on disease losses, to include applications that diminish production inefficiencies and now incorporates research projects designed to meet consumer demands and protect Canada's ability to access export markets. Through this evolution, VIDO's research activities have led to the successful commercialization of seven vaccines. These successes include 1) the world's first effective vaccine against *K-99 E.coli* calf scours (VICOGEN), 2) the world's first tissue culture vaccine against haemorrhagic enteritis in turkeys (Hevlan-TC) and 3) the world's first genetically-engineered animal vaccine (PNEUMOSTAR). Most recently, another first was achieved with the successful commercialization of PNEUMOSTAR-4 (a vaccine for swine, that stimulates a protective immune response against the common North American strains of the bacteria that cause swine pleuro-pneumonia).

VIDO faces many challenges during these changing times of reduced government funding to the non-profit sector and increased demands on producer-derived funding. Consistent funding (sufficient to retain a central nucleus of trained, world-class research scientists) has always been a challenge for VIDO and its people.

At the same time, change has led to opportunities for VIDO to pursue and undertake collaborative research projects on a regional, national and international basis. Change has also expanded the opportunities for VIDO to seek and perform contract research on the behalf of international biopharmaceutical houses and other agencies. Advances in science and technology continue to present opportunities for exploring new horizons and applying technologies, once thought not to be feasible.

Elsewhere in this annual report, you will be provided with descriptions of the research projects that VIDO is currently undertaking including issues relative to food quality, food safety, consumer acceptance and international trade. VIDO, like the industries it serves, has evolved... and will continue to do so as we enter the next millennium.

RESEARCH REPORT

Science Section

Over the past decade, significant changes have occurred in the food industry at all levels. These changes have resulted, in part, from a recognition that producers, processors, retailers, and consumers are part of one integrated industry rather than simply individual components in a chain. Virtually all of VIDO's research in its early days was devoted to understanding infectious diseases of livestock and poultry with the goal of increasing the economic competitiveness of producers and reducing animal suffering. This work led to the successful commercialization of seven vaccines with a number of others now in the process of technology transfer. However, new issues related to the safety and quality of animal products relative to other food sources have led to new research areas which must be addressed in conjunction with VIDO's traditional infectious disease research.

Diseases of humans which can be transmitted via animal products are a growing concern at both consumer and government levels. For example, Salmonella species, *Escherichia coli* O157, and Campylobacter species are organisms that do not usually cause clinical disease in animals yet are major issues with consumers and export markets. New approaches to reduce the prevalence of these pathogens starting at the farm are required. There is also a growing perception that the use of antibiotics in animal production is a major contributing factor in the development of human pathogens which cannot be effectively treated. Organizations such as the World Health Organization have stated that antibiotic use in animals leads to drug-resistant bacteria which can be passed through the food chain. Whether or not this is true is not an issue; if animal products are to be considered safe by the consumer, this issue must be addressed.

VIDO has responded with new research initiatives which address concerns of producers, processors and consumers. We believe that prevention of infectious disease is the most efficient means of increasing economic gain to producers and reducing animal suffering. However, this must be carried out with the needs of the producer, processor and ultimately the consumer in mind. VIDO currently has twelve major research projects, some of which are outlined below. These include the development of new methods to stimulate mucosal immunity, diagnostic assays for potentially infected animals, post weaning multisystemic wasting syndrome in swine and *E. coli* O157 infection of cattle.

Vectored Vaccines and Mucosal Immunity

Current vaccines for cattle are delivered primarily by intramuscular or subcutaneous injection. These routes of delivery induce systemic immune responses (serum antibody and cell-mediated immunity in spleen and other internal organs) but are not optimal for the induction of immunity at mucosal surfaces. These surfaces include those in the lung and upper respiratory tract, gastro-intestinal tract, urogenital tract, and the eyes. It is through these surfaces that over 90% of pathogens enter the body and thus providing immunity at the surfaces should provide much better disease prevention. In order to efficiently induce mucosal immunity, vaccines should be delivered directly to lymphoid tissue at these sites.

Molecular biology has opened new avenues for the development and delivery of vaccines that can induce mucosal immunity. One such vaccine delivery system being developed and evaluated at VIDO is the bovine adenovirus vector. The genes coding for protective antigens from other viruses and bacteria can be inserted into the adenovirus genome, resulting in the delivery of antigens to mucosal surfaces via the nasal or oral routes. We have selected bovine adenovirus for use as a vector since it is rarely associated with clinical disease and can be manipulated in the laboratory quite efficiently relative to other vectors. Dr. Suresh Tikoo and his team have fully characterized this virus and developed methods for the rapid insertion of foreign genes at specific sites which will reduce the virulence of the virus. The insertion of such genes from other cattle pathogens is now in progress and preliminary experiments using adenovirus expressing the bovine herpesvirus-1 gD gene indicate that intranasal immunization of cotton rats results in the induction of mucosal immune responses. These recombinant vectors are now being tested in cattle.

The use of these vaccine vectors for the oral immunization of newborn calves is also being evaluated. Viral and bacterial diarrhea and respiratory infections in neonatal calves have a major impact on the cattle industry. Protection of the neonate is conferred through colostral antibody. However, there are numerous situations where the transfer of immunity fails to provide adequate protection. The recombinant adenovirus vector is an excellent technology platform for the development of an oral vaccine for newborn calves. To prove the concept of neonatal immunization with adenovirus vaccine vectors, we have used a newborn lamb model to show that delivery of the vaccine vector into the intestine of newborn lambs induces both strong mucosal and

Andrew Potter
Associate Director

systemic immune responses. Furthermore, the transfer of antibody through colostrum did not interfere with the induction of these immune responses. We have also shown that immunization of newborn lambs with the adenovirus vector expressing the BHV-1 gD protein induces long-term immunological memory in both the intestine and the lungs. These experiments indicate that it may be possible to use oral immunization of the neonate to protect against both intestinal and respiratory infections.

The use of this technology platform will not only result in increased protection at mucosal surfaces and therefore benefit producers, but will also reduce carcass damage caused by injection of conventional vaccines as well as a reduction in residues present in conventional adjuvants. Thus, the use of these products will result in a better, safer and higher quality product for consumers.

Food Quality

Infections in cattle not only decrease productivity for the producer, but also contribute to losses in the processing industry. The current meat inspection system is based upon visual inspection of live cattle for slaughter and examination of carcasses after slaughter and is therefore dependent on subjective determinations by inspectors. The increasing importance of food safety in our society, together with higher risks associated with intensive animal management systems and high volume processing plants, places considerable demands upon this inspection system. Assurances of food safety would be improved greatly if infection could be more easily detected.

The symptoms of disease which are observed are the result of not only the infecting organism but also the animal's response to the infection. A common example of this response is fever. At VIDO, we have identified a number of reactions in addition to fever that occur. One of these is an increase in the amount of a protein called haptoglobin in the blood. Thus, by measuring the amount of haptoglobin in the blood we can monitor the host response to infection and develop tests capable of detecting a variety of diseases early in their development. We have monitored the serum haptoglobin concentration in two disease models, bovine respiratory disease caused by bovine herpesvirus-1 and *Pasteurella haemolytica*, and septicemia caused by *Haemophilus somnus*. Increases in haptoglobin concentration were shown to be a sensitive indicator of the onset of bacterial infection and the level of haptoglobin was associated with the severity of disease.

We are currently conducting studies to assist the utility of haptoglobin measurement in slaughtered cattle. The main objective of these studies is to describe the range and frequency of haptoglobin concentration in various types of slaughter cattle and analyze for relationships with disease conditions. From this information we can determine the value of haptoglobin testing for screening to prevent the entry of potentially infected cattle to the kill floor. We have found that the vast majority of cattle entering the slaughter plant have

undetectable levels of haptoglobin, just as the vast majority pass veterinary inspection. Cattle which have abnormalities detected by inspection also have an increased frequency of detection of haptoglobin. Thus, the haptoglobin results corroborate the inspection findings in many cases. Whether haptoglobin testing can be used to improve the accuracy of veterinary inspection remains to be determined.

We have been developing a "cow-side" test which can be utilized to measure haptoglobin concentration and are also exploring the possibility of using biosensor technology to monitor both individual animals as well as herds from remote locations. We are hopeful that this technology will allow producers and processors to compile information on the status of animals on the farm through to slaughter.

VIDO is also exploring other methods of vaccine formulation and delivery which will reduce tissue damage due to injection as well as residues from mineral oil-based adjuvants commonly incorporated into vaccines. These include the use of formulations containing liposomes rather than conventional oil-based adjuvants, using both intranasal and transdermal routes of delivery. Also, DNA vaccines are being developed which could eliminate the need for any adjuvant.

Ultimately, all of these vaccine and delivery technologies will eliminate the need for conventional synthetic adjuvants and will either have no adjuvant or those which are biodegradable. We believe that this will be accepted by the public as a safer product and will increase the economic return to producers and processors due to less carcass damage.

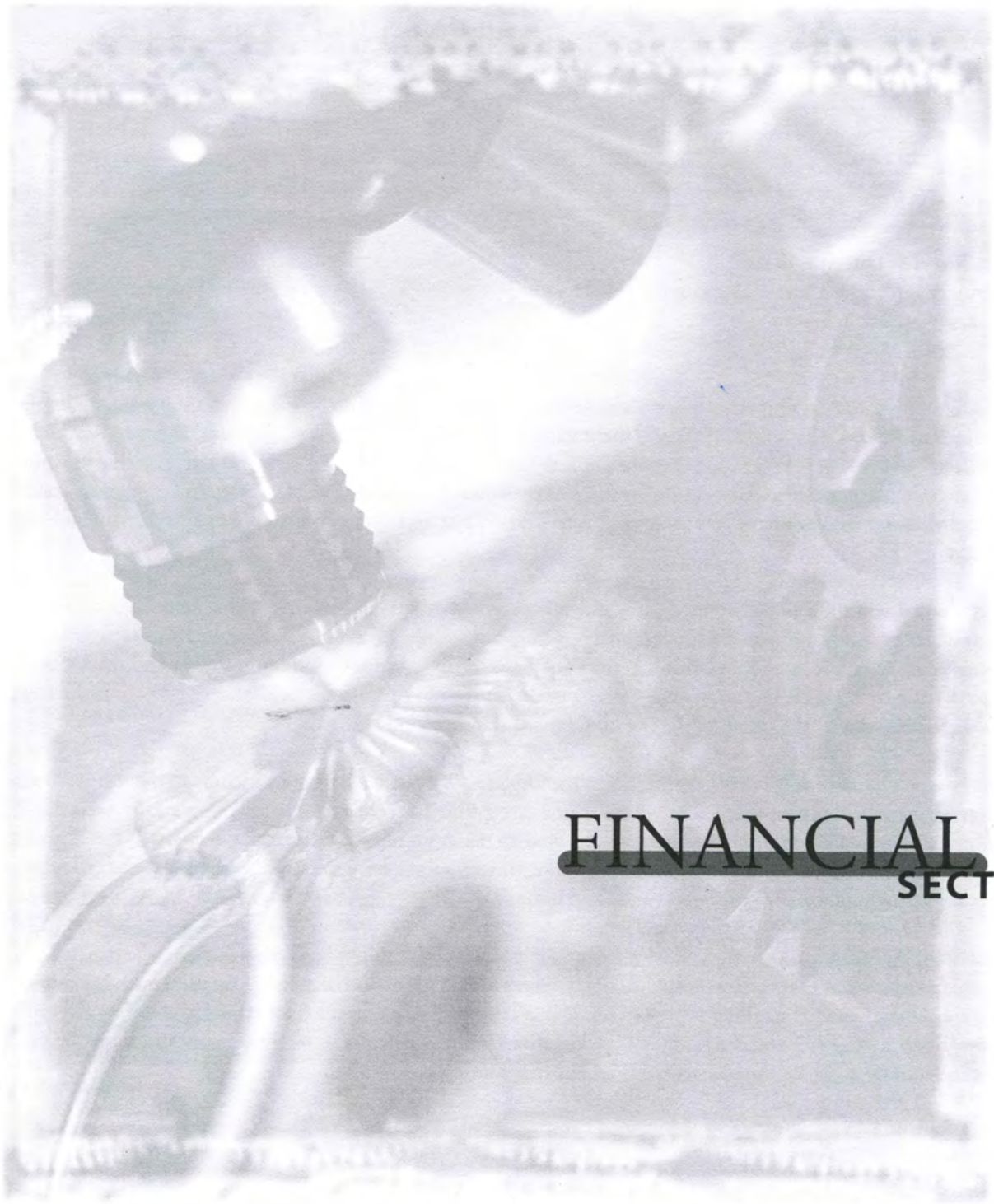
Food Safety: Export Markets and the Consumer

Food safety issues can have a dramatic effect on the international movement of animals and animal products, affecting producers, processors and consumers. A recent example of this which has received press coverage worldwide is the bovine spongiform encephalopathy controversy in the United Kingdom. However, there are a number of other examples closer to home affecting both the swine and beef industries.

E. coli O157 is the cause of "hamburger disease", and can lead to severe kidney disease and ultimately death in humans. As the name suggests, one of the main sources of this bacteria is processed beef, although numerous other sources have also been identified. The organism is a common inhabitant of cattle where it does not cause clinical disease. During 1997, there were examples of shipments of both Canadian and American beef destined for export which were turned back due to the presence of this organism. While a number of approaches are being taken to improve detection methods and eliminate this organism, it is likely that an integrated approach starting on the farm through the processing plant will be needed to reduce levels significantly. We believe that one attractive method is vaccination on the farm and we have initiated a collaborative research program with Dr. Brett Finlay of the University of British Columbia who has identified several new targets for vaccine development. These proteins are involved in attachment of *E. coli* O157 to cells in the intestine and therefore, vaccination using these proteins should block the ability of the organism to colonize the gut. We believe that this technology will ultimately yield a valuable tool for the prevention of *E. coli* O157 colonization which, when used in conjunction with other methods to reduce the quantity of this organism in processing plants, will lead to safer and higher quality beef.

The value of hogs produced in Canada is more than $2.5 billion annually and nearly one quarter of the carcass weight was exported in 1996. In fact, Canada was the fourth top pork exporting country last year. New diseases which affect the industry can have a devastating impact not only upon producers but also upon maintenance and expansion of these export markets. During recent years, a new disease of swine called post-weaning multisystemic wasting syndrome (PMWS) has been identified in a number of countries and is of particular interest because it occurs in herds where many other disease problems are well controlled. The presence of this disease in Canada has led for calls in other countries to ban import of Canadian pork products and therefore it is essential that solutions for the control of this new disease be found. VIDO's response to this opportunity has been to establish a program of research into the causes of the disease and to ultimately develop methods for its control. We have started this by reproducing the signs of PMWS in pigs exposed to homogenized tissue obtained from pigs with the disease. This demonstrated that it was indeed an infectious disease and we are now working on the identification of the primary agent associated with it. Porcine circovirus has been identified as one likely causative agent and we are currently characterizing field isolates of the virus associated with disease. The results to date indicate that the DNA sequence of these field isolates differs from others which do not cause disease and we are therefore continuing our work to develop an animal model using purified virus as well as to utilize this knowledge for the development of vaccination strategies. Through this, combined with the ability to distinguish vaccinated from infected animals, VIDO hopes to offer a tool not only to reduce economic losses to producers, but to allow expansion of export markets based upon the quality of the Canadian product.

In summary, infectious disease research continues to be an important means of reducing animal suffering and increasing the economic benefit to producers. However, as VIDO has evolved, a recognition that this cannot be done without examining the effects on other links in the food chain has emerged. Thus, our research programs today are focused on multiple stakeholders, from the farm through to the consumer.



FINANCIAL SECTION

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AUDITORS' REPORT

To the Board of Directors of the
Veterinary Infectious Disease Organization (VIDO),
University of Saskatchewan

We have audited the combined balance sheet of the University of Saskatchewan - Veterinary Infectious Disease Organization as at September 30, 1997 and the statements of income, expenditure and fund balance (Research Trust, Dr. Alfred Savage VIDO Research Fund, Capital Trust and Technology Development Trust) and combined statement of changes in financial position 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 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 statments. 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 common with many non-profit organizations, the Organization derives part of its income in the form of donations and certain grants the completeness of which is not susceptible to satisfactory audit verification. Accordingly, our verification of revenues from these sources was limited to the amounts recorded in the records of the Organization and we were not able to determine whether any adjustments might be necessary to donations and grant revenue, excess of income over expenditure, assets and fund balance.

In our opinion, except for the effect of adjustments, if any, which we might have determined to be necessary had we been able to satisfy ourselves concerning the completeness of donations and certain grants referred to in the preceding paragraph, these financial statements present fairly, in all material respects, the financial position of the Organization as at September 30, 1997 and the results of its operations and the changes in its financial position for the year then ended in accordance with generally accepted accounting principles.

Deloitte & Touche

Chartered Accountants

December 23, 1997

Deloitte Touche Tohmatsu International

University of Saskatchewan
Veterinary Infectious Disease Organization (VIDO)

RESEARCH TRUST
Statement of Income, Expenditure and Fund Balance
Year Ended September 30, 1997

Carol Martel
Manager
Financial Operations

	1997	1996
INCOME		
Donations and unconditional grants (Schedule 1)		
Livestock industry - beef	$ 116,700	$ 115,350
- dairy	50,000	40,000
- swine	119,806	129,262
- poultry	41,330	-
Provincial governments	41,690	18,350
Other foundations, companies and individuals	200	25
	369,726	302,987
Conditional grants (Schedule 2)	1,896,313	1,790,721
Contract research		
Department of Western Economic Diversification	565,649	519,197
Commercial	343,533	93,177
Associated Company	320,448	214,012
Government of the Province of Saskatchewan	300,000	325,000
Department of National Defence	115,393	191,349
Contract services	49,091	149,214
Royalties	189,125	212,368
Interest	43,610	47,265
Animal sales	34,373	23,524
University of Saskatchewan	138,211	137,112
Miscellaneous Income	460	1,220
	4,365,932	4,007,146
EXPENDITURE		
Salaries and fringe benefits	2,523,255	2,308,929
Materials and supplies	568,906	541,738
Animal services	174,370	103,966
Equipment and service agreements	297,124	186,673
Travel and recruiting	137,126	127,498
Patents and legal fees	152,701	90,832
Other expenditures (Note 7)	130,457	187,630
	3,983,939	3,547,266
EXCESS OF INCOME OVER EXPENDITURE	381,993	459,880
FUND BALANCE, BEGINNING OF YEAR	1,299,166	951,286
	1,681,159	1,411,166
TRANSFER TO CAPITAL TRUST	200,000	112,000
FUND BALANCE, END OF YEAR	$ 1,481,159	$ 1,299,166

University of Saskatchewan
Veterinary Infectious Disease Organization (VIDO)

DR. ALFRED SAVAGE - VIDO RESEARCH FUND
Statement of Income, Expenditure and Fund Balance
Year Ended September 30,1997

	1997	1996
INCOME		
Interest	$ 6,401	$ 7,346
Other: Market Value Increase	8,712	-
	15,113	7,346
EXPENDITURES		
Administration fees	429	400
Equipment Purchase	-	1,170
	429	1,570
EXCESS OF INCOME OVER EXPENDITURE	$ 14,684	$ 5,776

	1997		1996	
	Restricted for Endowment Purposes	Expendable Funds	Restricted for Endowment Purposes	Expendable Funds
FUND BALANCE, BEGINNING OF YEAR	$ 56,697	29,143	$ 55,285	24,779
EXCESS OF INCOME OVER EXPENDITURE	1,334	13,350	1,412	4,364
	58,031	49,493	56,697	29,143
Transfer to Capital Trust	-	(31,196)	-	-
FUND BALANCE, END OF YEAR	$ 58,031	11,297	$ 56,697	29,143

University of Saskatchewan
Veterinary Infectious Disease Organization (VIDO)

CAPITAL TRUST
Statement of Income, Expenditure and Fund Balance
Year Ended September 30,1997

	1997	1996
INCOME		
Interest	$ 2,961	$ -
EXPENDITURES		
Building improvements - farm	10,266	-
Building improvements - lab	20,834	-
Equipment purchases	29,042	-
	60,142	-
EXCESS OF EXPENDITURE OVER INCOME	(57,181)	-
FUND BALANCE, BEGINNING OF YEAR	142,000	30,000
	84,819	30,000
Transfer from Dr. Alfred Savage VIDO Research Fund	31,196	-
Transfer from Research Trust	200,000	112,000
FUND BALANCE, END OF YEAR	$ 316,015	$ 142,000

TECHNOLOGY DEVELOPMENT TRUST
Statement of Income, Expenditure and Fund Balance
Year Ended September 30,1997

	1997	1996
FUND BALANCE, BEGINNING OF YEAR	$ 1,645,819	$ 4,699,876
Provision for Revaluation of Note Receivable	(967,899)	(3,054,057)
FUND BALANCE, END OF YEAR	$ 677,920	$ 1,645,819

University of Saskatchewan
Veterinary Infectious Disease Organization (VIDO)

Combined Balance Sheet
As at September 30,1997

(1996 figures restated - see Note 10)

ASSETS	1997	1996
CURRENT ASSETS		
Cash on hand	$ -	$ 76,746
Funds held - University of Saskatchewan	755,625	649,196
Due from University of Saskatchewan - operating fund	850,205	894,959
Accounts receivable (Note 3)	693,552	656,994
Inventories (Note 4)	150,804	101,200
	2,450,186	2,379,095
INVESTMENTS (Market $133,031)	133,031	54,843
NOTE RECEIVABLE (Note 5)	677,920	1,645,819
CAPITAL ASSETS		
Site and improvements	146,503	146,503
Furnishings, fixtures and equipment	488,794	459,752
Buildings and facilities	5,068,096	5,036,996
	5,703,393	5,643,251
	$ 8,964,530	$ 9,723,008
LIABILITIES		
CURRENT LIABILITIES		
Accounts payable	$ 10,500	$ 11,100
Unearned revenue (Note 6)	706,215	895,832
	716,715	906,932
EQUITY		
CAPITAL ASSETS	5,703,393	5,643,251
RESEARCH TRUST	1,481,159	1,299,166
DR. ALFRED SAVAGE VIDO RESEARCH FUND	69,328	85,840
CAPITAL TRUST	316,015	142,000
TECHNOLOGY DEVELOPMENT TRUST	677,920	1,645,819
	8,247,815	8,816,076
	$ 8,964,530	$ 9,723,008

APPROVED BY THE BOARD:

Fred van Knyen Director

Laura M. Kennedy Trustee

University of Saskatchewan
Veterinary Infectious Disease Organization (VIDO)

Combined Statement of Cash Flows

Year Ended September 30,1997

(1996 figures restated - see Note 10)

	1997	1996
CASH FROM OPERATING ACTIVITIES		
Research Trust-Excess Income over Expenditure	$ 381,993	$ 459,880
Technology Development Trust - Provision for valuation of Note Receivable	(967,899)	(3,054,057)
Dr. Alfred Savage VIDO Research Fund-Excess Income over Expenditure	13,350	4,364
	(572,556)	(2,589,813)
Net change in non-cash working capital	(231,625)	(236,930)
Net cash used in operating activities	(804,181)	(2,826,743)
CASH FLOWS FROM INVESTING ACTIVITIES		
Investment in University of Saskatchewan long term investment pool	(78,188)	(54,843)
Decrease in notes receivable	967,899	3,054,057
Purchase of Capital Assets	(60,142)	-
Net cash generated by investing activities	829,569	2,999,214
CASH FLOWS FROM FINANCING ACTIVITIES		
Dr. Alfred Savage VIDO Research Fund-Endowment Funds	-	80,064
Dr. Alfred Savage VIDO Research Fund-Excess Income over Expenditure	1,334	1,412
Capital Trust-Investment income related to capital purchase	2,961	-
Net cash generated by financing activities	4,295	81,476
NET INCREASE IN CASH	29,683	253,947
CASH,BEGINNING OF YEAR	725,942	471,995
CASH, END OF YEAR	$ 755,625	$ 725,942
CASH CONSISTS OF:		
Cash on hand	$ -	$ 76,746
Funds held - University of Saskatchewan	755,625	649,196
	$ 755,625	$ 725,942

University of Saskatchewan

Veterinary Infectious Disease Organization (VIDO)

Notes to the Financial Statements

September 30, 1997

1. ESTABLISHING AGREEMENT

The Organization was established by an Agreement dated August 11, 1975 between the Devonian Foundation of Calgary, Alberta, the Province of Alberta, the Province of Saskatchewan and the University of Saskatchewan to conduct research on indigenous infectious diseases of food producing animals.

Effective April 1, 1980 the above Agreement was replaced by a Constitution which provides for a Board of Directors to assume the responsibilities formerly performed by the Board of Advisors and the Governing Committee.

2. SIGNIFICANT ACCOUNTING POLICIES

These financial statements have been prepared in accordance with the following policies:

Fund accounting

Transactions of the Organization are accounted for by fund accounting principles which require classification of resources into funds reflecting the various designated uses. The Research Trust fund consists of those revenues and expenses used in the general operations of the Organization. The Capital Trust fund consists of grants, interest and authorized transfers from the Research Trust and Dr. Alfred Savage VIDO Research Fund for the purpose of acquiring capital assets. Funds are transferred from the Research Trust to operations and to the Capital Trust as approved by the Board of Directors. The Dr. Alfred Savage VIDO Research Fund was established as an endowment for VIDO until 2010. During the endowment period, 80% of the fund's annual interest earnings are available to purchase equipment, instruments, materials and supplies to be used in research projects. The Technology Development Trust fund consists of net income generated from Technology Access Agreements and the proceeds will be used for the future development of technology under patent or license. The balance sheet and combined statement of cash flows have been presented on a combined basis reflecting the activities of all funds.

Capital assets

Capital assets are recorded as Capital Trust expenditures when purchased. The same assets are included in the balance sheet as Capital Assets offset by the Capital Assets equity account. No depreciation is recorded on the capital assets.

Equipment purchased with Research Trust monies is expensed as purchased, and is not included in the balance sheet as assets.

The Constitution referred to in Note 1 states that all buildings and facilities constructed for the Organization shall be used by it in accordance with the Constitution and upon termination of the Organization, the buildings, facilities and equipment therein shall remain the absolute property of the University of Saskatchewan.

Inventories

Inventories of materials and supplies are valued at the lower of cost and net realizable value. Animal inventory is valued at cost.

Investments

Funds designated as endowment funds, restricted for the purposes of acquiring capital assets or future expenditures are invested with other funds from the University of Saskatchewan in long-term investment pools. Interest is allocated to each fund based upon it's prorated share of the investment.

Grants and donations

Grants and donations are recognized in these financial statements in the period defined in the terms or conditions of the respective grants or donations.

Grants and donations received without terms or conditions as to the period in which the grant or donation is to be used are recognized in the financial statements when received.

Unearned revenue consists of unexpended funds relating to specific grants and donations and is determined on the percentage of completion basis.

Royalties

Royalties are recognized as they are received or earned.

3. ACCOUNTS RECEIVABLE

	1997	1996
Donations and unconditional grants	$ 161,490	$ 86,380
Conditional grants (Schedule 2)	49,417	142,181
Contract research	367,934	358,319
Contract services	2,557	7,463
Royalties	100,000	60,875
Accrued interest	12,154	1,776
	$ 693,552	$ 656,994

4. INVENTORIES

	1997	1996
Animals	$ 80,430	$ 46,833
Materials and supplies	70,374	54,367
	$ 150,804	$ 101,200

5. NOTE RECEIVABLE

As of December 15, 1993, the University of Saskatchewan, as represented by VIDO, signed a Debenture/Debt Transfer Agreement with 598707 Saskatchewan Ltd., the trustee of the BIOSTAR Trust. This agreement transfers the debt obligation including related interest as evidenced by the Debenture made between BIOSTAR Inc. and the University of Saskatchewan, effective December 11, 1991, to 598707 Saskatchewan Ltd. Consideration for the transfer was a Promissory Note of $4,699,876 bearing no interest and due on demand. The only asset of the BIOSTAR Trust is shares in BIOSTAR Inc. The book value of those shares based on the audited financial statement of BIOSTAR Inc., is $677,920 at March 31, 1997 (1996-$1,645,819).

	1997	1996
Note Receivable consists of the following:		
Note Receivable	$ 4,699,876	$ 4,699,876
less: Allowance for Revaluation of Note Receivable	4,021,956	3,054,057
	$ 677,920	$ 1,645,819

6. UNEARNED REVENUE

	1997	1996
Donations and unconditional grants	$ 10,000	$ 14,633
Conditional grants (Schedule 2)	696,215	756,199
University of Saskatchewan	-	-
Contract Research	-	125,000
	$ 706,215	$ 895,832

7. OTHER EXPENDITURES

Other expenditures consist of VIDO operating accounts which include repairs and maintenance, equipment rental, annual report and technical bulletins, professional fees and Board expenses.

8. INCOME TAXES

The Organization is not subject to either federal or provincial income taxes.

9. RELATED PARTY TRANSACTIONS

a) VIDO is a research affiliate of the University of Saskatchewan. The University of Saskatchewan maintains, as part of its normal operations, various financial and administrative functions relating to VIDO. The financial statements do not include expenditures for administrative and ancillary services, or in-kind support provided by the University of Saskatchewan.

b) The University of Saskatchewan is the beneficiary of a Trust which owns 35.60% of BIOSTAR Inc. as at March 31, 1997 (1996-36.93%). BIOSTAR Inc. is a research and development company which assists VIDO in the development of its products and technologies. During the year VIDO had the following transactions with BIOSTAR Inc.:

	1997	1996
Income from BIOSTAR Inc. to VIDO		
Contract research	$ 320,448	$ 214,012
Contract services and leases	7,617	103,776
Royalties	189,125	212,368
Expenditures made by VIDO on BIOSTAR Inc.'s behalf	41,474	12,002

At September 30, 1997 the Organization has a receivable from BIOSTAR Inc. of $137,783 (1996 - $96,911).

c) In 1993, VIDO entered into technology access agreements relating to specific products with BIOSTAR Inc. Income of $4,699,876 generated from these agreements is in the Technology Development Trust fund. Consideration for this transaction was a Note Receivable (Note 5). During the current year, the allowance was increased by $967,899 to $4,021,956 to recognize a potential decline in value of this receivable.

10. RESTATED FINANCIAL STATMENTS

As a result of including the Dr. Alfred Savage VIDO Research Fund in the financial assets of VIDO, the equity of VIDO has increased by $69,328 in 1997 (1996-$85,840).

11. CONTINGENCIES

VIDO has entered into certain contractual arrangements which may require repayment of the contracted amount if the research sponsored by the contract results in commercialization. There are no amounts repayable under these contracts at September 30, 1997.

Griebel, P.J., Mutwiri, G., Tikoo, S., Van den Hurk, S., Braun, R., and Baca-Estrada, M. Investigations of Sheep Immunology and Novel Vaccine Strategies. National Symposium on Sheep Research and Technology Transfer, Guelph, ON October 24-25, 1997.

Griebel, P.J. Advances in Vaccine Delivery: Addressing the Beef Quality Issue. 1997 Saskatchewan Beef Symposium, Saskatoon, November 18-19 1997

Idamakanti, N., Reddy, P.S., Babiuk, L.A., and Tikoo, S.K. 1997. Transcriptional map of bovine adenovirus-3 early region-3. 16th Annual Meeting of ASV, Montana.

Jiang, M., MacLachlan, P.R., and Potter, A.A. 1997. Characterization of a lactoferrin-binding protein of *Streptococcus uberis* and its corresponding gene. American Society for Microbiology Annual Meeting, Miami, FL May 1997.

Papp, Zs., Babiuk, L.A., and Baca-Estrada, M.E. Respiratory mucosal immune responses induced by different routes of immunization with recombinant adenovirus vectors in cotton rats. 9th International Congress of Mucosal Immunology, January 1997, Sydney, Australia. Immunology and Cell Biology 75: A116.

Raggo, C., Watts, T., Bateman, C., Babiuk, L.A., and Griebel, P. 1997. Experimental bovine herpesvirus-1 infection in sheep. 22nd International Herpesvirus Workshop, San Diego, CA.

Reddy, P.S., Baxi, M.K., Lee, J.B., Idamakanti, N., Zakhartchouk, A.N., Pyne, C., Babiuk, L.A., and Tikoo, S.K. 1997. Determination and analysis of the complete nucleotide sequence of bovine adenovirus-3. 16th Annual Meeting of ASV, Montana.

Schwartzkopf, K.S., Stookey J.M., Godson D.L., Watts J.M., Flannigan G. and Waltz C.. The use of trainer cows to reduce stress in newly arrived feedlot calves. 1977. North American International Society of Applied Ethology. June 1997, Lennoxville, QC

van Drunen Littel-van den Hurk, S., Babiuk, L.A., Braun, R.P., Karvonen, B.C., and Lewis, P.J. 1997. Intradermal immunization with a bovine herpesvirus-1 DNA vaccine induces protective immunity in cattle. American Society for Virology 16th Annual Meeting, Bozeman, MA, USA. Abstract W27-12.

Watts, T., Allan, B., and Harland, R. Development of Clinical Scoring Systems to Avoid Death as an Endpoint. Second World Congress on Alternatives and Animal Use in the Life Sciences, Utrecht, The Netherlands October 1996.

Willson, P.J. Development of a recombinant vaccine to control *Actinobacillus pleuropneumoniae* in pigs. CSM Annual Meeting June 19, 1997.

Willson, P.J. Molecular pathogenesis using *Actinobacillus pleuropneumoniae* and *Streptococcus suis* as examples. VT MC 899.6 Special problems in veterinary microbiology, June 11, 1997.

Zakhartchouk, A.N., Pyne, C., Reddy, P.S., Baxi, M.K., Rasmussen, U.B., Meyer, V., Mehtali, M., Babiuk, L.A., and Tikoo, S.K. 1997. Development of bovine adenovirus-3 vectors based on E3 region deletion. 16th Annual Meeting of ASV, Montana.

Reports and Presentations to the Livestock Industry, External Groups, and Organizations

Allan, B.J. Diseases of poultry caused by *Escherichia coli*: An overview of VIDO's research. Dept. of Veterinary Pathology Seminar, WCVM, Saskatoon, SK

Allan, B.J. Cellulitis in broiler chickens: What we know and what we need to know. Saskatchewan Poultry Industry Conference, Saskatoon, SK March 1997.

Froese, C., Gelderman, J., Gowans, J., Hahn, D., Heuser, W., Hodgkinson, D., Marshall, F., Prejet, R., Snider, T., Stilborn, B., Vermette, W., Vielfaure, P., Visser, P., Waddington, J., Whittington, L., and Willson, P. 1996. Dry Sow Barn Design and Management. Veterinary Infectious Disease Organization.

Froese, C., Hodgkinson, D., Marshall, F., Snider, T., Vermette, W. , Waddington, J., Whittington, L., and Willson, P. Dry Sow Barn Design and Management. VIDO Swine Technical Group, BC Pork Symposium, November 28, 1996.

Habermehl, N.L. 1997. How agribusiness firms and the Chamber can work together to position Saskatoon as the premier agribusiness centre in Western Canada. Saskatoon Chamber of Commerce, Agribusiness Committee. Saskatoon, SK June 17, 1997.

Habermehl, N.L. 1997. Environmental Streptococcal mastitis research update: Status, advances, and challenges. Dairy Farmers of Ontario. Mississauga, ON August 27, 1997

Peace, S.D. and Willson, P.J. Strains of *Streptococcus suis* with a diversity of serotypes share common protein antigens. Prairie Swine Centre Annual Report. 62-64, 1996.

Potter, A.A. Alberta Milk Producers Annual Meeting. Vermillion, AB June 4, 1997

Rawlyk, N., Willson, P.J., Potter, A., and Evans B. VIDO Mastitis Research Programs. Canada Dairy Expo, April 10-11, 1997.

Tikoo, S.K. and Babiuk, L.A. 1997. Development of BAV-3 as a live viral vector. Transgene, Strasbourgh, France.

Tikoo, S.K. 1997. Structure, function, and construction of a cell line expressing BHV-1 glycoprotein gH. Pfizer Animal Health, Groton, CT.

Willson, P.J. *Actinobacillus pleuropneumoniae* vaccine for swine, Manitoba farm radio interview, January 2, 1997

Willson, P.J. VIDO Swine Research Programs. Alberta Pork Producers Development Corporation Research Committee, March 5, 1997.

Willson, P.J. VIDO Swine Research Programs. Saskatchewan Pork International Research Committee, March 1997.

Willson, P.J. *Streptococcus suis* Vaccine Development. Manitoba Pork Annual Meeting. April 9-10, 1997.

Chapters in Books, Expository, and Review Articles

Dudler, L., Griebel, P.J., and Hein, W.R. Separation of mononuclear cells from blood. In: *In Vitro* Techniques in Experimental Immunology in Sheep, 1997. In: Immunological Methods Manual. Lefkovits, I. (ed). Academic Press, London UK

Godson, D., Baca-Estrada, M.E., and Babiuk, L.A. Applications of bovine cytokines. In: Cytokines in Veterinary Medicine. Eds. Schijns, V.E.C.J. and Horzinek, M.C. 1997. CAB International, Oxon, UK

Griebel, P.J. Isolation of lymphoid follicles from Peyer's patches. *In Vitro* Techniques in Experimental Immunology in Sheep. 1997. In: Immunological Methods Manual. Lefkovits, I. (ed). Academic Press, London UK

Griebel, P.J. Culture of ileal Peyer's patch B cells. *In Vitro* Techniques in Experimental Immunology in Sheep. 1997. In: Immunological Methods Manual. Lefkovits, I. (ed). Academic Press, London UK

Hein, W.R. and Griebel, P. (Section Editors) *In Vitro* Techniques in Experimental Immunology in Sheep. 1997. In: Immunological Methods Manual. Lefkovits, I. (ed). Academic Press, London UK

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Canadian Bacterial Diseases Network Personnel - At Various Centres Throughout Canada

A network of over 50 investigators from seven Canadian universities, a number of industrial companies, and government laboratories interested in bacterial diseases of humans, animals, and fish.

VIDO

FINANCIAL SUPPORTERS

The following groups and agencies contributed funds to VIDO over the course of the past fiscal year through donations, grants, or contracts. Their support is acknowledged and greatly appreciated.

Agriculture Canada
Alberta Agriculture Research Institute
Alberta Cattle Commission
Alberta Chicken Producers
Alberta Milk Producers
Alberta Pork Producers Development Corporation
Bayer Corporation
BC Hog Marketing Commission
Beef Industry Development Fund
BIOSTAR Inc.
Boehringer Ingelheim (Canada) Ltd.
Canadian Bacterial Diseases Network
Canadian Turkey Marketing Agency
Cattle Industry Development Council
Dairy Farmers of Ontario
Government of Canada - Department of Western Economic Diversification
Government of Canada - Department of National Defense
Health Services Utilization & Research Commission
Kamloops Stockmen's Association
Mallinckrodt Veterinary Inc.
Manitoba Pork *est.*
Medical Research Council
Natural Sciences & Engineering Research Council of Canada
Nuvotech Ventures Int.'l.
Ontario Cattlemen's Association
Ontario Pork Producer's Marketing Board
Pfizer Inc.
Province of Alberta - Alberta Agriculture
Province of British Columbia - Ministry of Agriculture, Fisheries, & Food
Province of Manitoba - Manitoba Agriculture
Saskatchewan Agriculture Development Fund
Saskatchewan Beef Development Board
Saskatchewan Cattle Marketing Deductions Fund
Saskatchewan Health Research Board
Saskatchewan Horned Cattle Trust Fund
Saskatchewan Research Council
Saskatoon Livestock Marketing Assoc.
SPI Marketing Group
Swine Improvement Services Co-operative Ltd.
Transgene SA
Vetrepharm Canada Inc.
World Health Organization