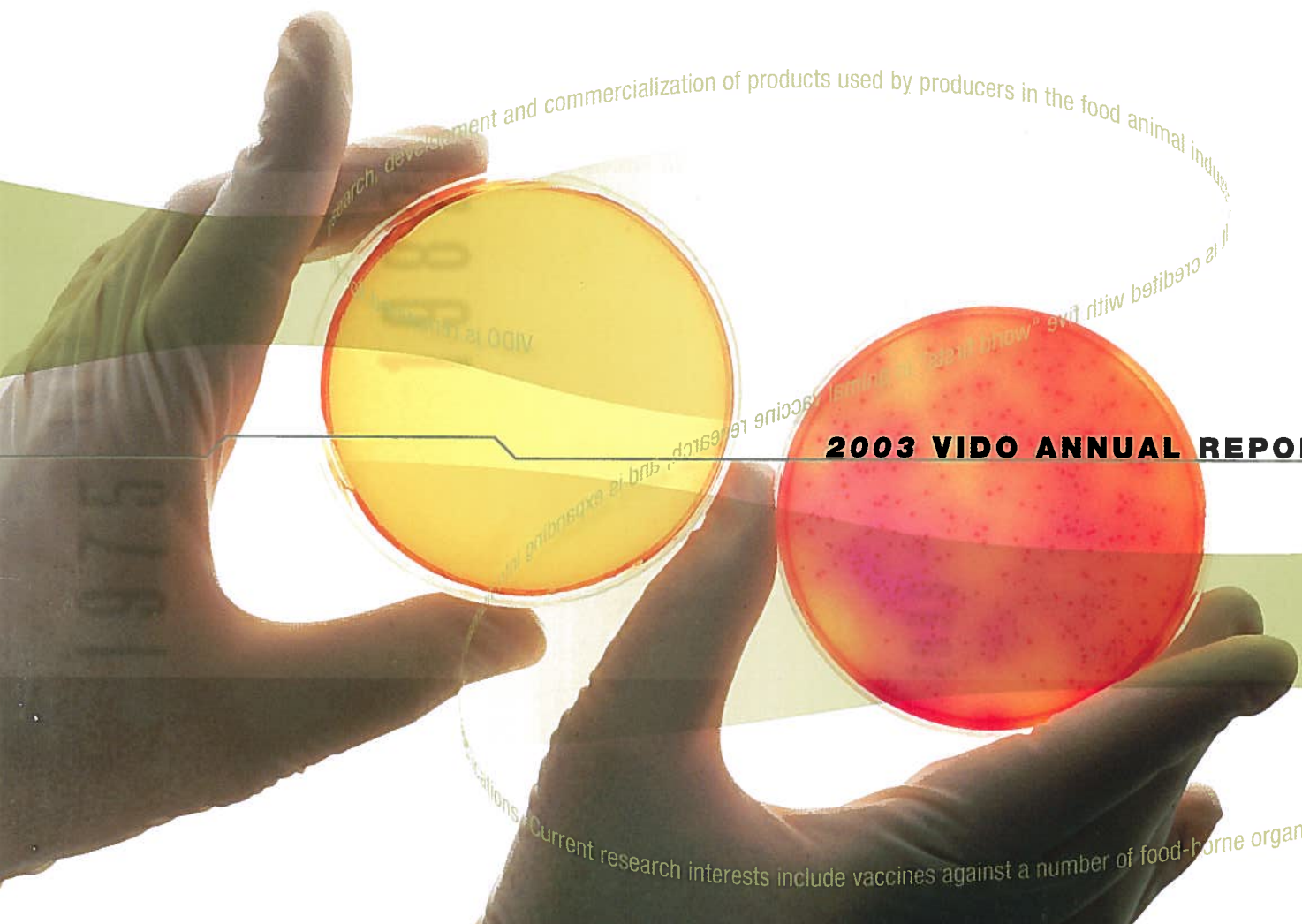




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**IMAGINATION**



**2003 VIDO ANNUAL REPORT**

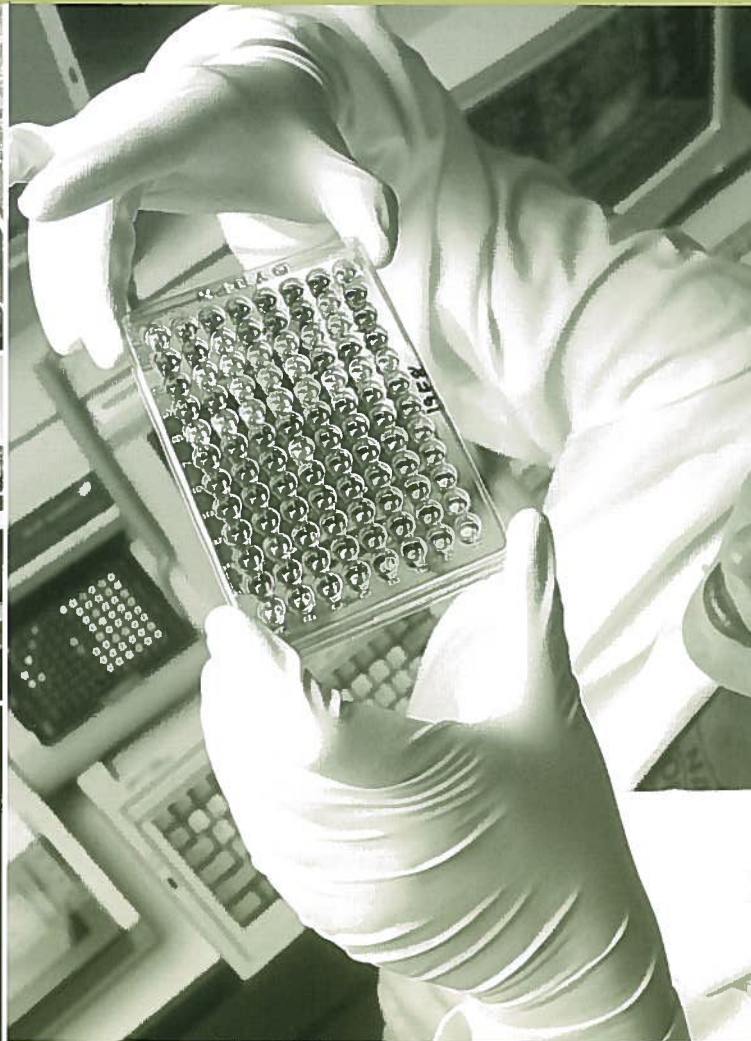
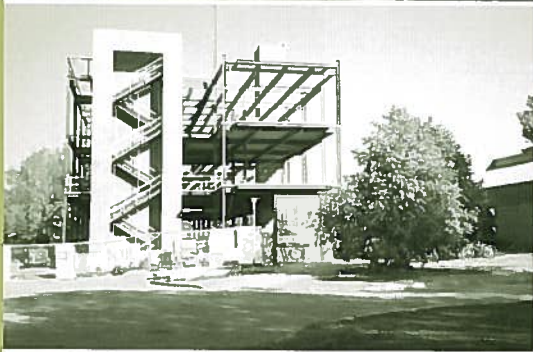


Current research interests include vaccines against a number of food-borne organisms, and novel vaccine delivery systems



## WORLD RENOWNED

VIDO is renowned for the research, development and commercialization of products used by producers in the food animal industry. It is credited with five "world firsts" in animal vaccine research, and is expanding into human health applications. Current research interests include vaccines against a number of food-borne organisms, and novel vaccine delivery systems including needle-free methods. A wholly owned University of Saskatchewan not-for-profit organization, VIDO operates with substantial support from the governments of Alberta and Saskatchewan as well as Government of Canada and industry competitive grants. It collaborates extensively with external institutes and companies and provides a rich training environment.





# Vaccine & Infectious Disease Organization

**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. **VIDO'S GOALS:** *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 preventative 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.





DR. LORNE BABIUK - Director

## LETTER TO OUR STAKEHOLDERS

Innovation continues to be a focus in Canada as we strive to increase our competitiveness in the global community. The people who make up VIDO know that many factors are critical to the chain of innovation, and imagination is one of the most crucial. Without imagination, the power to create new ideas, technologies or products – to innovate – is extremely limited. VIDO's vision is to be an engine of innovation and to push our creativity to the limits. Indeed, our belief is that our imagination will be what ensures our success.

In business, the term “return on investment” (ROI), is what all venture capitalists and investors strive for. We put a twist on it and call it the return on our imagination. Thus, imagination and its fulfillment provide VIDO and Canada a competitive advantage. Although sometimes we may not achieve all that we had imagined, our motto is “if we don't fail at least sometimes, we didn't try hard enough.” It is through failure that we learn, and it is failure that pushes us to achieve more than if we hadn't made the attempt at all.

In parallel with its innovation agenda, VIDO is also pursuing a commercialization agenda. Our belief is that no matter how innovative or imaginative

an organization or country is, without embracing the second phase (commercialization), society will not benefit. We are happy to support the federal government in its commercialization agenda. To

*...we are still VIDO, and our history and founding roots remain intact.*

this end, VIDO continues to forge partnerships that enable us both to develop and market our technologies and to expand receptor capacity for our discoveries and those of other university researchers.

### A YEAR OF NEW DISEASE CHALLENGES

VIDO is blessed with a flexibility that allows us to re-align our goals in response to emerging needs. Today, hardly a week goes by without some news regarding infectious diseases of animals or humans. Currently, more than 70 per cent of newly emerged or re-emerging diseases of humans originate in animals. Indeed, controlling infection in animals can have a dramatic impact on human health. Examples with which we are very familiar include *E. coli* O157: H7, which is shed into the environment from animals and can



have devastating effects in humans; and the equally devastating SARS virus. Thus, addressing diseases that affect both animals and humans makes very good economic sense.

**A YEAR OF GROWTH**

This past year, VIDO has achieved a significant milestone in the opening of a 50,000 sq. ft. laboratory and office wing. This addition was made possible through our original vision to extend the impacts of our research across a broader range of diseases by capitalizing on the convergence of human and animal health, and the emergence of the powerful new technologies of genomics and proteomics. Our expansion into the realm of human infectious diseases necessitated a broadening of our mandate and a name change from the Veterinary Infectious Disease Organization to the Vaccine & Infectious Disease Organization. Our expanded mandate will enhance our ability to obtain support for our research. But we are still VIDO, and our history and founding roots remain intact.

**A YEAR OF COMMITMENT**

The success of VIDO has always been dependent upon strong ties with other scientists worldwide, both through collaborations and funding relation-

ships with governments, academia and private industry. Our partners sustain our viability, and have shown their faith in us time and again by investing in VIDO. It was our tradition of partnership in all that we do that led to the reality of our new wing enabling the extension of our research. The Canada Foundation for Innovation was the agency that conducted the International Scientific Review of the proposal, and provided \$5.1 million to the project. Other partners included the Province of Saskatchewan (\$5.6 million), Western Economic Diversification Canada (WD, \$4.5 million), the Province of Alberta (\$2 million), and the University of Saskatchewan (\$500,000). After completion of the building, WD provided a further \$1.14 million to completely equip the laboratories. As a result of these partnerships, we have a fully functional laboratory with all the required equipment to support our research programs in infectious diseases. Our senior management continue to seek opportunities for partnership and are a driving force for economic growth within our province.

The expansion of our facilities will help us embrace a new phase in our growth by providing us resources to host visiting scientists from other universities, industry and government. These



**DR. ANDY POTTER,**  
Associate Director - Research



**JOYCE SANDER, C.I.M., P.Mgr.**  
Manager - Human Resources



**CAROL MARTEL, C.M.A.**  
Manager - Financial Operations



**DR. LOUIS DESAUTELS**  
Chief Operating Officer





## LETTER TO OUR STAKEHOLDERS CONTINUED...

interactions will further expand our collaborations with academics around the world. The expansion provides us opportunity to extend our linkages with industry by hosting industry scientists who will work alongside our scientists. We feel this

*The impacts of our inventions  
will be felt by those whom  
they are intended to help.*

capability is not only innovative but efficient, as it will help transfer discoveries from the laboratory to industry and beyond to commercialization, in a seamless manner. As a result, the impacts of our inventions will be felt by those whom they are intended to help.

### A YEAR OF FORTITUDE

Although this year has been one of rapid change at VIDO, staff have weathered the upheaval extremely well. I am especially grateful to them for their understanding during the construction phase which was not only disruptive, but also taxed their interpersonal skills: in some cases,

three scientists shared an office designed for one - creating a unique bonding opportunity. I thank you for your support and trust that the inconvenience experienced during this past year was worth the wait.

As a not-for-profit organization, VIDO does not pay its Board of Directors. Thus, I would like to specifically thank the dedicated individuals who have agreed to serve on VIDO's board and provide their insight and guidance throughout this year. It is always amazing to see how their varied experiences benefit VIDO as they collaborate in designing a strategy and building a business plan to ensure our success for years to come.

Once again, we thank our partners in the livestock industry, government, private industry, the University of Saskatchewan and our academic collaborators across Canada for their continued support of VIDO's research efforts and their commitment to ensuring that Canada remains a leader in research.



VIDO's grand opening ceremony in the fall of 2003. Speakers included VIDO Director Lorne Babluk; the Hon. Ralph Goodale, then Minister of Public Works and Government Services Canada; the Hon. Judy Junor, then Minister of Learning; the Hon. Eric Cline, Minister of Saskatchewan Industry and Resources; Dr. Robert Davidson, Director, Programs and Services, Canada Foundation for Innovation



# Vaccine & Infectious

**VIDO CHAIRMAN'S REPORT**

Canada's producer community is certainly being tempered by one livestock industry crisis after another. Successive years of drought were followed by BSE, which has devastated producers in the beef industry and also affected almost every other agricultural enterprise. As these communities struggle with challenges that good management or associations cannot protect them from, in an era of prion diseases, SARS and West Nile virus, research on livestock diseases – and at the animal-human interface – is crucial. Yet, the devastating financial impacts of disease on animal agriculture – resulting from closures of international markets – are often more damaging than the disease itself. Therefore, finding solutions to these problems has become increasingly important, particularly for a nation like Canada, which is dependent upon international trade as a contributor to its continued prosperity.

Since its inception, VIDO has worked to develop vaccines for the protection of livestock against disease. In fact, five of these vaccines were world firsts. The opening of the expansion to VIDO's facilities in the fall of 2003 was a celebration of the improved capacity for VIDO's infectious disease research. As a result of the expansion, more than 30 new positions were created at VIDO – an even broader range of talent and expertise working to protect livestock and humans from disease.

VIDO is committed to maintaining the voice of the agricultural community in its day-to-day operations – through its two technical groups (beef and swine), its Board of Directors, through regular communications targeting the producer industry, and by hosting various producer-related conferences and seminars. Yet over the past several years, VIDO has increasingly found ways



*Brad Wildeman is Manager of Poundmaker Agventures Ltd. and Director of the Canadian Cattlemen's Association.*

# Disease Organization



# leadership

2002-2003 VIDO  
Board of Directors

Mr. Brad Wildeman (Chair)  
Mr. Peter Schuld (Vice-Chair)

Dr. Lorne Babiuk

Mr. Dickson Gould

Dr. Bryan Harvey

Mr. John Hoover

Dr. Larry Milligan

Mr. Thomas Nash

Mr. Gordon Nystuen

Dr. Chuck Rhodes

Dr. Howard Tennant

Dr. W. Ronald Osborne

8

## VIDO CHAIRMAN'S REPORT CONTINUED...

to apply technology gleaned through research on diseases of livestock to human diseases. This makes the use of VIDO's research dollars highly efficient. In light of the ongoing research activities highlighted in

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*VIDO has increasingly found ways to apply technology gleaned through research on diseases of livestock to human diseases.*

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this report, VIDO's Board of Directors fully expects VIDO to maintain and extend its reputation as an international centre of excellence in infectious disease research.

The combination of VIDO's existing expertise and its physical proximity to the soon-to-be-operational Canadian Light Source synchrotron will significantly enhance the potential for development of truly innovative vaccines, and will also bring even greater national and international collaboration with scientists from an expanded field of expertise.

For these reasons, and the talent and creativity of VIDO's scientists, the organization is in an ideal position to tackle emerging diseases, and will continue to fulfill its mandate of providing solutions for the benefit of its stakeholders – even more effectively than in the past. As a university-owned research institute, VIDO takes its responsibilities seriously – it is accountable for its research, its finances, its communications, its personnel and day-to-day operations. And, the expanded facilities will only serve to increase the opportunities for graduates from the University, many of whom are Saskatchewan residents.

As this is my final report as Chairman, I would like to express my appreciation for this opportunity to serve VIDO and interact with a great team of committed people, led by our Director, Lorne Babiuk. I have thoroughly enjoyed my time here, and look forward to VIDO's future with anticipation.

*Brad Wildeman*



# Vaccine & Infectious



## HELPING OTHERS SUCCEED

What is VIDO's most important asset? The answer is easy – it's our employees. It is through this group of dedicated people that VIDO's growth and success is achievable – that we remain competitive and attract high calibre scientists to Saskatchewan. VIDO is committed to meeting the needs of our people. Our goal is to provide the very best working environment, the very best resources and the highest level of support to our employees.

VIDO plays a very active role in training. At any time, a minimum of one third of VIDO's staff is made up of trainees – from undergraduate to graduate students and postdoctoral fellows, both national and international. VIDO has always provided tremendous opportunity for graduating students to continue to develop their expertise in their chosen fields of research, and is a valuable addition to the University of Saskatchewan. We also open our doors for visiting scholars and

scientists on sabbatical leaves. We believe that we can and are contributing to Canada's status as an innovator in research, by providing the interdisciplinary training opportunities that will equip our "alumni" to perform competitively in academia, industry or government. We are continually contacted by head-hunters for universities, research institutes and industry seeking our trainees for employment.

Part of what makes us such a sought-after training and working environment is that VIDO strives to maintain an atmosphere in which creativity is encouraged, accomplishments are recognized, dreams are achieved and opinions are heard. VIDO's Director plays a key role in our stimulating working environment: Dr. Lorne Babiuk had a vision of growth and expansion; he shared his vision with his co-workers and then together, we developed a plan to make this vision a reality.

achievement

Disease Organization

## PERFORMING UNIQUE CANADIAN RESEARCH

Over the past five to 10 years, we have witnessed the emergence and re-emergence of a number of infectious disease threats to both human and animal health. These have included agents such as SARS and avian influenza, as well as disease outbreaks caused by food and environmental pathogens such as enterohemorrhagic *E. coli* and *Cryptosporidium parvum*, to name but a few.

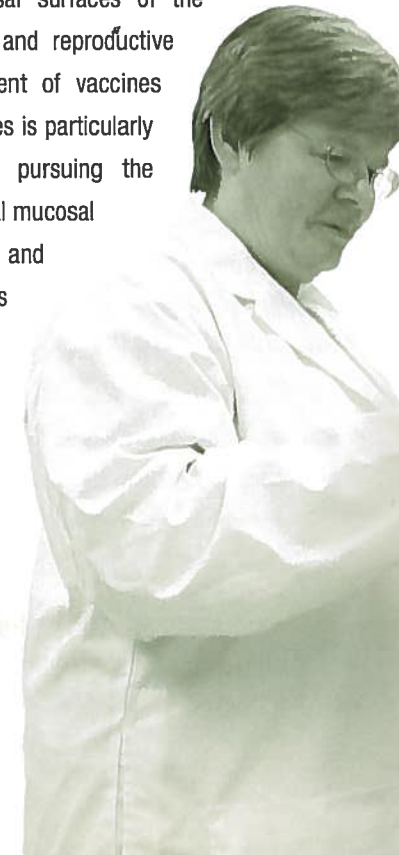
*More than 60 per cent of human infectious diseases have an animal origin, and more than 70 per cent of new diseases affecting humans originate in animals.*

More than 60 per cent of human infectious diseases have an animal origin, and more than 70 per cent of new diseases affecting humans originate in animals. In spite of this, the fields of human and animal health have traditionally been viewed as independent, with little in the way of linkages at a research level. Since disease prevention strategies are the same in both hosts, VIDO believes that a significant opportunity exists for having an impact in both areas - by establishing common technologies. VIDO has focused much of its efforts over

the past decade on fundamental pathogenesis studies, as well as the development of "platform technologies" which have application in both fields.

### **Protection at the source – mucosal vaccine delivery**

Vaccines have changed little over the past 50 years. This is primarily because advances in formulation and delivery have not kept pace with methods for antigen (the key immune-system stimulating ingredient of a vaccine) production. Since most pathogens cause disease by colonizing the mucosal surfaces of the respiratory, digestive and reproductive tracts, the development of vaccines which target these sites is particularly attractive. VIDO is pursuing the development of several mucosal vaccine technologies and formulations. Examples include live-vectored viral and bacterial vaccines; novel subunit vaccines, in which one component of a pathogen is used to stimulate the



immune response; and killed vaccines in which the virus or bacteria is treated so that it cannot cause disease. Novel delivery methods include oral and intranasal delivery.

#### **A virus knows best**

**Dr. Suresh Tikoo** and his group have pioneered the use of bovine and porcine adenoviruses as live delivery vehicles for antigens from a variety of animal and human pathogens. As delivery vehicles, the natural infective capability of a virus or bacteria is co-opted to deliver the vaccine.

Bovine adenoviruses are usually involved in subclinical respiratory and enteric infections and can easily be attenuated or inactivated by the deletion of specific genes. Dr. Tikoo's group has demonstrated through proof of concept trials that vectored viral vaccines with insertions using a number of different genes coding for protective proteins are effective. In addition, the group has been characterizing the interaction of adenoviruses with host cells and has successfully demonstrated

that vaccines can be manipulated to target either the respiratory tract or gut, depending upon the application.

#### **Vaccines that pack an extra punch**

The delivery of killed or subunit vaccines to animals is more problematic than live viruses or bacteria due to degradation of the antigen and the requirement for adjuvants - substances that increase the magnitude of the immune response. In addition, the type of immune response induced by conventional vaccines is often biased towards the production of antibody, which can actually be detrimental to the animal in the case of some infections. **Dr. George Mutwiri** and his team have been attempting to maximize immune responses to subunit and killed vaccines through the use of novel adjuvant formulations as well as immunomodulators such as CpG - a short genetic sequence most often found in bacterial DNA, recognized by the immune systems of animals as a threat. Compounds such as alginate, liposomes and polyphosphazenes (synthetic polymers) have been tested at VIDO for their ability to induce not only immune responses in the blood, lymph and tissues, but also mucosal immunity in both the respiratory tract and gut. Such formulations have been shown to increase not only the magnitude of the local immune responses relative to



diversity



science

conventional adjuvants, but also the quality of the immune response. This work has been carried out in a number of animal model systems, including cattle, swine and poultry. Such formulations have been demonstrated to be compatible with needle-free delivery methods

*Such formulations have been demonstrated to be compatible with needle-free delivery methods such as intranasal and oral immunization.*

such as intranasal and oral immunization, making them especially valuable for the induction of immunity at the site of infection. These delivery methods will also eliminate tissue reactivity often associated with the use of conventional vaccines, a phenomenon which has been shown to cost cattle producers several dollars per animal.

**A vaccine factory?**

Over the past decade, VIDO has pioneered the use of nucleic acid vaccines in livestock as an alternative method of inducing immunity. This technology involves the introduction of genes coding for protective antigens (proteins or molecules from specific viruses, bacteria or parasites) into the animal. The introduced genes then produce the antigen inside the animal. This technique has several advantages over conventional vaccines, especially for inducing protection against viruses and parasites. These advantages include a decreased cost of

production, the ability to modulate the immune response, effectiveness in newborns and the ability to induce long-lasting immunity.

Although vaccines are not normally effective in neonates due to interference from the mother's antibodies, **Dr. Sylvia van Drunen Littel - van den Hurk** and her group have recently demonstrated that maternal antibodies against a bovine herpesvirus glycoprotein did not inhibit the development of immune responses in animals vaccinated with nucleic acid vaccines. However, these maternal antibodies did interfere with the effectiveness of an alternate vaccine formulated with recombinant subunit products. The group is continuing to optimize immunization schedules in the neonate and continues to apply the technology to the development of vaccines against a wide variety of infectious agents affecting animals and humans.

**Tapping into the immune response for disease protection strategies**

During the past year, VIDO and collaborators at Pyxis Genomics, Inimex Pharmaceuticals, the University of British Columbia and Simon Fraser University initiated a genomics research program dealing with the analysis of immune responses at mucosal surfaces in both animals and humans. The objective of the project is to identify genes and pathways involved in pathogen recognition and the mounting of innate (natural) and adaptive (antigen-specific) immune responses, both in the lung and in the gut. VIDO is well positioned to undertake these studies due to the wide variety of animal

models developed over the past two and a half decades, which permit studies determining the overall picture of genetic interactions to be carried out with natural host-pathogen interactions.

**Dr. Philip Griebel** and his group have made significant progress in the past year in the analysis of bovine responses to viral and bacterial gene expression in the gut and respiratory tract. This work has been carried out both in vivo using whole animal studies as well as in vitro with purified cell populations. The results obtained to date offer exciting new targets for disease intervention and are consistent with those obtained both at VIDO and elsewhere over the past two decades. Coupled with this research, VIDO researchers have also been studying the effect of immune stimulants upon gene expression patterns. Similar work is also being carried out using chicken respiratory and enteric models. The data obtained from these studies is currently being used to design new vaccination strategies as well as therapeutics against specific diseases and we anticipate testing the latter over the next 12 months.

#### **Vaccines to improve food safety**

VIDO continues to work on the development of specific vaccines for both humans and animals, utilizing the platform technologies described above where appropriate. A major focus of the research carried out by **Dr. Phil Willson's** group over the past three years has been the development of vaccines to prevent the colonization of animals by human pathogens. In collaboration with Dr. Brett Finlay at the University of British Columbia, the researchers have successfully demonstrated proof of concept for vaccination of cattle as a means

of reducing the levels of *E. coli* O157, and similar collaborative work with researchers at the National Research Council of Canada is underway on *C. jejuni* vaccines for poultry. It is anticipated that this work will be expanded during the coming year to include Salmonella vaccines for both poultry and cattle.

#### **Embracing new challenges**

We have previously reported on VIDO's first human vaccine project, namely hepatitis C virus, and this work has been extended over the past year to include SARS. VIDO is uniquely positioned to work in this field due to our expertise in platform technologies for vaccine formulation and delivery, as

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*The results offer exciting new targets for disease intervention.*

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well as previous experience at VIDO in developing vaccines for a related pathogen, bovine coronavirus. VIDO's work in this field is part of a large collaborative effort with other Canadian scientists, and the results to date have been very encouraging. We will continue to initiate new projects in the human vaccine field as the opportunity arises to apply VIDO's expertise and technologies.

#### **Research backed by world-class expertise**

VIDO continues to operate in a collaborative fashion, both internally and externally, in order to maximize interactions and use of resources. **Dr. Sam Attah-Poku's** chemistry group has played a pivotal role in all



organizational activities by providing expertise in nucleic acid and peptide technologies to all programs, as well as to VIDO's external collaborators.

VIDO's research programs all require the development of relevant disease models to support our studies on basic pathogenesis, pathogenomics and vaccine testing. Over the years, **Dr. Don Wilson** and his clinical staff have successfully developed a number of such models, focusing on respiratory and enteric infections. With our expansion into human infectious disease research, there has been a need to establish new models such that pathogenesis and vaccine studies can be carried out in more relevant systems than those currently used. An excellent example of this is the work being carried out by VIDO's formulation and delivery group, which has established a reproducible model for *Bordetella pertussis* – the causative agent of whooping cough

– infection in swine. The pathology observed in swine appears to mimic that found in the human host and is clearly more relevant than the mouse models which are currently in widespread use. These studies are being followed up with vaccination experiments to determine if the model can be used to develop new vaccination strategies which ultimately will be used to protect the human neonate.

Bovine and avian gut loop models are also being refined for the study of the interaction of zoonotic pathogens with their animal host. Such organisms include enterohemorrhagic *Escherichia coli*, *Campylobacter jejuni* and *Salmonella* species. These models allow not only fundamental studies on colonization to be carried out, but also genomic studies aimed at elucidating host and pathogen responses during colonization.



## COMMUNICATIONS AND PRODUCER RELATIONS

VIDO is growing and changing, as our March 2003 name change attests. As emerging technologies allow us to apply more of our work across species and diseases, our mandate expands. The relationship between animals and emerging human diseases emphasizes the need for an organization like ours – that has the resources and the support from the livestock industry to perform research benefiting both animals and humans.

For every research dollar spent on “platform technologies,” VIDO can apply this knowledge to benefit humans or other species. And awards from the livestock community make up a significant part of VIDO’s income as a non-profit organization: producer dollars are often leveraged two to three times. We also gratefully acknowledge the advocacy support we receive from the producer communities in recognition of VIDO’s efforts.

VIDO has always maintained close ties with Canada’s producer community – our best source of information as to the needs and concerns of the livestock industry. Producers are represented on our Board of Directors and assist in guiding VIDO. Four years ago, we hired a new Producer Relations Manager to build and extend that communications link. **Stuart Bond** became a well-liked and

well-known figure in the producer industry, and it was with regret that we saw him retire in July 2003. We wish Stuart the very best and take this opportunity to thank him for his years of service and the groundwork he has laid in building relationships between VIDO and the producer community.

To maintain the relationships built by Stuart, **Dr. Keith Schneider** was hired in October 2003 as Producer Relations Manager. Dr. Schneider continues to carry VIDO’s message to the industry. VIDO’s two technical groups, which drive the collection and dissemination of livestock management information to the industry, continue to develop resources for producers, and have been working on two new major reports for the swine and beef industries to be available in the new year.

Producer relations continue to play an important and expanding role at VIDO. A new administrative department was created in March 2003 and new staff hired. **Dr. Louis Desautels** joined VIDO’s management team in the spring of 2003 as Chief Operating Officer. Dr. Desautels joins VIDO from a background in veterinary medicine and the pharmaceutical industry, bringing a wealth of experience in drug development and production medicine.





VIDO has made a new commitment to extend our communications capacity. Over the past several years, we have worked with a consultant who has been remarkably successful in carrying VIDO's research stories to the national and international media, and our relationship with them continues. To augment our in-house capacity, we hired a Communications Officer, **Tess Laidlaw**, in September 2003. Ms. Laidlaw's background in research and health-related communications and her education in journalism are proving to be a valuable asset for VIDO.

We look forward to the next year in which we will further expand our efforts to communicate VIDO's research stories and successes to national and international audiences.



**2003 VIDO ANNUAL REPORT**



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financial section



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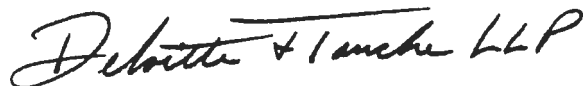
## AUDITORS' REPORT

### TO THE BOARD OF DIRECTORS OF THE VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO), UNIVERSITY OF SASKATCHEWAN

We have audited the combined balance sheet of the Vaccine & Infectious Disease Organization (VIDO), University of Saskatchewan as at September 30, 2003 and the statements of income, expenditure and fund balance (Research Trust, Dr. Alfred Savage VIDO Research Fund and Capital Trust) and combined statement of 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 September 30, 2003 and the results of its operations and its cash flows for the year then ended in accordance with Canadian generally accepted accounting principles.



**Chartered Accountants**

Saskatoon, Canada  
January 14, 2004

Member of  
Deloitte Touche Tohmatsu

**VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN**

**RESEARCH TRUST - STATEMENT OF INCOME, EXPENDITURE AND FUND BALANCE  
YEAR ENDED SEPTEMBER 30, 2003**

	<u>2003</u>	<u>2002</u>
<b>INCOME</b>		
Donations and unconditional grants (Schedule 1)	\$ 371,005	\$ 359,784
Conditional grants (Schedule 2)	6,514,964	4,939,191
Amortization of Conditional grants - Building expansion (Note 6)	242,198	257,302
Contract research		
Department of Western Economic Diversification	-	(3,631)
Commercial	2,046,272	1,719,001
Government of the Province of Saskatchewan		
-Saskatchewan Department of Agriculture, Food and Rural Revitalization	300,000	300,000
-Saskatchewan Industry and Resources	-	731,106
Gift-in-kind	-	187,189
Licensing fees	-	43,209
Royalties and dividends	415,236	414,503
Investment income	101,028	58,237
Animal sales	140,872	489,556
University of Saskatchewan (Schedule 2)	254,633	145,670
	<u>10,386,208</u>	<u>9,641,117</u>

*See accompanying notes*

**VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN**

**RESEARCH TRUST - STATEMENT OF INCOME, EXPENDITURE AND FUND BALANCE  
YEAR ENDED SEPTEMBER 30, 2003**

	2003	2002
<b>EXPENDITURE</b>		
Salaries and benefits	5,149,297	4,381,498
Materials and supplies	2,249,794	2,483,773
Animal services	202,170	315,561
Equipment repair and service agreements	215,740	325,048
Sub-contract research (Note 8)	28,500	(18,293)
Travel and recruiting	256,672	250,311
Patents and legal fees	312,861	186,489
Amortization	689,910	524,554
Other expenditures (Note 9)	229,107	404,670
	<b>9,334,051</b>	<b>8,853,611</b>
<b>EXCESS OF INCOME OVER EXPENDITURE</b>	<b>1,052,157</b>	<b>787,506</b>
<b>FUND BALANCE, BEGINNING OF YEAR</b>	<b>5,733,837</b>	<b>5,187,426</b>
	<b>6,785,994</b>	<b>5,974,932</b>
<b>CAPITAL TRUST ASSET PURCHASES, NET OF FUND TRANSFER</b>	<b>140,960</b>	<b>(241,095)</b>
<b>FUND BALANCE, END OF YEAR</b>	<b>\$ 6,926,954</b>	<b>\$ 5,733,837</b>

*See accompanying notes*



VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN

DR. ALFRED SAVAGE VIDO RESEARCH FUND  
STATEMENT OF INCOME, EXPENDITURE AND FUND BALANCE  
YEAR ENDED SEPTEMBER 30, 2003

	2003			2002		
	Restricted for Endowment Purposes	Expendable Funds	TOTAL	Restricted for Endowment Purposes	Expendable Funds	TOTAL
EXCESS OF INCOME OVER EXPENDITURE						
Investment (Loss) Earnings \$	1,523	\$ 4,101	\$ 5,624	\$ (1,908)	\$ 1,409	\$ (499)
FUND BALANCE, BEGINNING OF YEAR	<u>61,784</u>	<u>27,649</u>	<u>89,433</u>	<u>63,692</u>	<u>26,240</u>	<u>89,932</u>
	63,307	31,750	95,057	61,784	27,649	89,433
Transfer expendable funds to endowment funds	<u>8,591</u>	<u>(8,591)</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>
FUND BALANCE, END OF YEAR	<u>\$ 71,898</u>	<u>\$ 23,159</u>	<u>\$ 95,057</u>	<u>\$ 61,784</u>	<u>\$ 27,649</u>	<u>\$ 89,433</u>

See accompanying notes

VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN

CAPITAL TRUST

STATEMENT OF INCOME, EXPENDITURE AND FUND BALANCE  
YEAR ENDED SEPTEMBER 30, 2003

	<u>2003</u>	<u>2002</u>
EXCESS OF INCOME OVER EXPENDITURE		
Investment earnings	\$ 47,460	\$ 24,651
Gifts-in-Kind	<u>82,000</u>	<u>-</u>
	129,460	24,651
FUND BALANCE, BEGINNING OF YEAR	<u>1,159,405</u>	* 893,659
Purchase of Capital Assets	<u>(140,960)</u>	<u>(8,905)</u>
Transfer from Research Trust	-	250,000
	<u>(140,960)</u>	241,095
FUND BALANCE, END OF YEAR	<u>\$ 1,147,905</u>	<u>\$ 1,159,405</u>

*See accompanying notes*

VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN

COMBINED BALANCE SHEET  
AS AT SEPTEMBER 30, 2003

<u>ASSETS</u>		
	<u>2003</u>	<u>2002</u>
CURRENT ASSETS		
Funds held - University of Saskatchewan	\$ 2,962,036	\$ 2,745,249
Due from University of Saskatchewan	-	3,903,285
Accounts receivable (Note 3)	1,190,622	677,478
Inventories (Note 4)	<u>201,502</u>	<u>152,781</u>
	4,354,160	7,478,793
INVESTMENTS	900,531	842,929
CAPITAL ASSETS (Note 5)	<u>19,622,163</u>	<u>7,552,433</u>
	\$ <u>24,876,854</u>	\$ <u>15,874,155</u>

*See accompanying notes*



**VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN**

**COMBINED BALANCE SHEET  
AS AT SEPTEMBER 30, 2003**

<u>LIABILITIES</u>	<u>2003</u>	<u>2002</u>
<b>CURRENT LIABILITIES</b>		
Due to University of Saskatchewan	\$ 1,638,836	\$ -
Accounts payable	15,400	11,800
Accrued vacation pay	474,469	375,905
Unearned grants (Schedule 2)	<u>1,151,821</u>	<u>1,372,373</u>
	<b>3,280,526</b>	<b>1,760,078</b>
UNEARNED GRANTS - BUILDING EXPANSION (Note 6)	<u>13,426,412</u>	<u>7,131,402</u>
	<u><b>16,706,938</b></u>	<u><b>8,891,480</b></u>
<b>EQUITY</b>		
RESEARCH TRUST	\$ 6,926,954	\$ 5,733,837
DR. ALFRED SAVAGE VIDO RESEARCH FUND	95,057	89,433
CAPITAL TRUST	<u>1,147,905</u>	<u>1,159,405</u>
	<u><b>8,169,916</b></u>	<u><b>6,982,675</b></u>
	<u><b>\$ 24,876,854</b></u>	<u><b>\$ 15,874,155</b></u>

APPROVED BY THE BOARD:

Brad Wilkerson Director

Laura M. Kennedy Trustee

*See accompanying notes*

**VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN**

COMBINED STATEMENT OF CASH FLOWS  
YEAR ENDED SEPTEMBER 30, 2003

	<u>2003</u>	<u>2002</u>
<b>CASH FLOWS FROM (USED IN) OPERATING ACTIVITIES</b>		
Cash received from Livestock industry	\$ 350,105	\$ 343,184
Cash received from Provincial governments and individuals	20,900	16,600
Cash received from Conditional grants	5,884,167	4,494,798
Cash received as Gift in Kind	82,000	187,189
Cash received from Contract research	2,346,272	2,757,726
Cash received from Royalties, licensing and dividends	415,236	457,712
Cash received from University of Saskatchewan	151,870	195,043
Interest income received for operating purposes	101,028	58,237
Cash paid for Salaries and benefits	(5,047,133)	(4,254,424)
Cash paid for Materials, supplies and sub-contractors	(2,327,015)	(2,490,746)
Cash paid for Patent and legal costs	(312,861)	(186,489)
Cash paid for Animal services, net of animal sales	(61,298)	337,342
Cash paid for Other expenditures	(700,104)	(1,061,186)
	<u>903,167</u>	<u>854,986</u>
Interest earned on Dr. Alfred Savage VIDO Research Fund	4,101	1,409
Net cash generated through operating activities	<u>907,268</u>	<u>856,395</u>
<b>CASH FLOWS USED IN INVESTING ACTIVITIES</b>		
Increase in University of Saskatchewan investment pool	(57,602)	(8,193)
Purchase of capital assets from Capital Trust	(140,960)	(8,905)
Purchase of capital assets from Research Trust, net of disposals	(784,672)	(198,910)
Purchase of capital assets from Research Trust-Building expansion funds	(11,835,423)	(4,424,397)
Net cash used in investing activities	<u>(12,818,657)</u>	<u>(4,640,405)</u>

*See accompanying notes*

**VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN**

**COMBINED STATEMENT OF CASH FLOWS  
YEAR ENDED SEPTEMBER 30, 2003**

	<u>2003</u>	<u>2002</u>
<b>CASH FLOWS FROM (USED IN) FINANCING ACTIVITIES</b>		
Funds received for building expansion - Research Trust	6,503,175	3,573,918
Increase (Decrease) in Dr. Alfred Savage VIDO Research Fund investments	1,523	(1,908)
Interest income received on Capital Trust Funds	47,324	24,490
Interest earned on building expansion funds	34,033	38,331
Net cash provided by financing activities	<u>6,586,055</u>	<u>3,634,831</u>
<b>NET (DECREASE) INCREASE IN CASH HELD</b>	<b>(5,325,334)</b>	<b>(149,179)</b>
CASH, BEGINNING OF YEAR	<u>6,648,534</u>	<u>6,797,713</u>
CASH, END OF YEAR	<u>\$ 1,323,200</u>	<u>\$ 6,648,534</u>
Funds Held - University of Saskatchewan	\$ 2,962,036	\$ 2,745,249
Due (to) from University of Saskatchewan	<u>(1,638,836)</u>	<u>3,903,285</u>
	<u>\$ 1,323,200</u>	<u>\$ 6,648,534</u>

*See accompanying notes*



VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN

NOTES TO THE FINANCIAL STATEMENTS  
SEPTEMBER 30, 2003

**1. AUTHORITY and PURPOSE**

The Vaccine & Infectious Disease Organization (VIDO) 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 infectious diseases of animals. VIDO's name was changed from the Veterinary Infectious Disease Organization to the Vaccine & Infectious Disease Organization on March 19, 2003.

Effective April 1, 1980 the above Agreement was replaced by a Constitution which was amended September 23, 1996. The Constitution 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 Canadian generally accepted accounting principles which include the following policies:

**FUND ACCOUNTING**

VIDO follows the deferral method of accounting for contributions and grants to each of its funds. VIDO classifies its funds by purpose and objective as follows:

The Research Trust fund consists of revenue and expenditures related to VIDO's program delivery and administrative activities. This may also include funds raised specifically for the building expansion and for the purchase of other assets through grants.

The Capital Trust fund consists of grants, investment earnings and authorized transfers from the Research Trust fund and Dr. Alfred Savage VIDO Research Fund to be used for the purpose of acquiring capital assets approved by the Board of Directors.

The Dr. Alfred Savage VIDO Research Fund was approved as an endowment for VIDO until 2010. During the endowment period, a portion of the fund's annual investment earnings are available to purchase equipment, instruments, materials and supplies to be used in research projects.

**USE OF ESTIMATES**

The preparation of the financial statements in accordance with Canadian generally accepted accounting principles requires management to make estimates and assumptions that affect the amounts reported in the financial statements and notes to the financial statements. Actual results may differ from those estimates.

**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 a long-term investment pool. Long-term investments are carried at market value.

VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN

NOTES TO THE FINANCIAL STATEMENTS  
SEPTEMBER 30, 2003

**REVENUE RECOGNITION**

Restricted contributions are recognized as revenue of the Research Trust fund in the year in which the related expenditures are incurred. Donations and unconditional grants are recognized as revenue of the Research Trust fund when received.

License fees, research payments and royalties are recognized as they are received under the terms of the agreements with the licensees or contractors. Gifts-in-kind, including equipment are recorded at fair market value on the date of their donation. The financial statements do not include certain investment revenue received by the University of Saskatchewan from VIDO revenue sources.

Investment income earned on the Dr. Alfred Savage VIDO Research Fund is recognized as income of that fund; a portion of the fund's earnings is retained for reinvestment. Investment income earned on the Research Trust fund and Capital Trust fund is recognized as revenue when earned.

Royalties are recognized as they are received or earned.

**UNEARNED GRANTS - BUILDING EXPANSION**

Various funding parties have designated grants and commitments for the building and equipping of the expansion to the VIDO facility (Note 6). Restricted funds received for this purpose are accounted for under the deferral method whereby the contribution is deferred and recognized as revenue on the same basis as the amortization expense related to the acquired capital assets.

The current year amortization is \$242,198 (2002 - \$257,302).

**CAPITAL ASSETS**

Purchased capital assets are recorded at cost. Donated capital assets are recorded at fair market value upon receipt. Amortization is provided on a straight-line basis over the asset's estimated life as follows:

Computers	3 years	Software	3 years
Vehicles	6 years	Furnishings and equipment	8 years
Site improvements	20 years	Buildings	40 years

In the year of acquisition, amortization is prorated based on the date of acquisition. For the building expansion, amortization began when the assets were put into use.

**3. ACCOUNTS RECEIVABLE**

	<u>2003</u>	<u>2002</u>
Conditional grants (Schedule 2)	\$ 1,188,588	\$ 675,580
Accrued interest	2,034	1,898
	<u>\$ 1,190,622</u>	<u>\$ 677,478</u>

**4. INVENTORIES**

	<u>2003</u>	<u>2002</u>
Animals	\$ 67,863	\$ 66,373
Materials and supplies	133,639	86,408
	<u>\$ 201,502</u>	<u>\$ 152,781</u>

**5. CAPITAL ASSETS**

	<u>2003</u>		<u>2002</u>	
	<u>Cost</u>	<u>Accumulated Amortization</u>	<u>Net Book Value</u>	<u>Net Book Value</u>
Computers	\$ 502,109	\$ 319,552	\$ 182,557	\$ 92,122
Software	23,379	13,009	10,370	5,544
Vehicles	151,883	97,787	54,096	75,789
Furnishings and Equipment	6,274,164	1,933,486	4,340,678	2,386,916
Site Improvements	250,532	149,455	101,077	31,971
Buildings	18,013,666	3,080,281	14,933,385	4,960,091
	<u>\$ 25,215,733</u>	<u>\$ 5,593,570</u>	<u>\$ 19,622,163</u>	<u>\$ 7,552,433</u>

VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN

NOTES TO THE FINANCIAL STATEMENTS  
SEPTEMBER 30, 2003

**6. UNEARNED GRANTS – BUILDING EXPANSION**

Unearned grants reported in the Research Trust fund include the unamortized portions of restricted funding designated for the building and equipping of an expansion to the VIDO facility.

Funding details and amortization to revenue are as follows:

	<u>Committed</u>	<u>Received to 2003</u>	<u>2003 Revenue</u>	<u>Prior Years Earned</u>	<u>2003 Unearned</u>	<u>2002 Revenue</u>
Western Economic Diversification	<b>\$ 4,500,000</b>	<b>2,817,085</b>	<b>62,529</b>	42,406	<b>2,712,150</b>	(42,406)
Canada Foundation for Innovation	<b>5,151,773</b>	<b>3,795,343</b>	<b>71,655</b>	94,971	<b>3,628,717</b>	2,564,282
Province of Saskatchewan Alberta Science and Research Authority	<b>5,651,773</b>	<b>5,210,000</b>	<b>78,533</b>	53,260	<b>5,078,207</b>	2,606,740
- Income earned	<b>2,000,000</b>	<b>2,000,000</b>	<b>29,481</b>	22,633	<b>1,947,886</b>	1,997,367
- Interest earned		<b>106,326</b>	-	46,874	<b>59,452</b>	25,419
	<b><u>\$ 17,303,546</u></b>	<b><u>13,928,754</u></b>	<b><u>242,198</u></b>	<u>260,144</u>	<b><u>13,426,412</u></b>	<u>7,131,402</u>

Funds received from Alberta Science and Research Authority and interest earned on those funds are restricted to the purchase of equipment.

**7. BUILDING EXPANSION**

During the year, VIDO began expansion of its research capacity to include genomics, therapeutics, new delivery systems and diagnostics research. To accommodate this, construction and equipping of a 51,476 square foot building addition estimated to cost \$18.5 million began in March, 2002. As at September 30, 2003, the building was substantially completed.



VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN

NOTES TO THE FINANCIAL STATEMENTS  
SEPTEMBER 30, 2003

**8. SUB-CONTRACT RESEARCH**

During the year VIDO entered into sub-contract research collaborations with various third parties relating to funding from conditional grants and contracts including the following:

	<u>2003</u>	<u>2002</u>
Dalhousie University.	\$ 28,500	\$ -
SemBioSys Genetics Inc.	-	29,000
National Research Council of Canada	-	(47,293)
	<u>\$ 28,500</u>	<u>\$ (18,293)</u>

**9. 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.

The financial statements do not include expenditures for in-kind support and services provided by the University of Saskatchewan.

**10. INCOME TAXES**

VIDO is not subject to either federal, provincial or capital income taxes. VIDO is required to pay GST, net of rebates and PST on taxable services and supplies.

**11. RELATED PARTY TRANSACTIONS**

a) VIDO is a research unit of the University of Saskatchewan. The University of Saskatchewan maintains, as part of its normal operations, various infrastructure services (utilities, caretaking, building maintenance), financial and administrative functions relating to VIDO. These costs are partially offset by investment earnings on VIDO funds maintained by the university.

b) The University of Saskatchewan is the beneficiary of a Trust which owns 16.53% of Star Biotech Inc. as at March 31, 2003 (2002-16.53%). Star Biotech Inc. is an investment holding company. Prior to the sale of the research and development assets, it was a research development company associated with the development of some of VIDO's products and technologies. During the year VIDO had the following transactions with Star Biotech Inc.:

	<u>2003</u>	<u>2002</u>
Income from Star Biotech Inc. to VIDO		
Royalties	<u>\$ 100,000</u>	<u>\$100,000</u>

**12. 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, 2003.

**13. COMPARATIVE FIGURES**

Certain of prior year's comparative figures have been reclassified to conform to the current year's presentation.

**VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO),  
UNIVERSITY OF SASKATCHEWAN**

SCHEDULE OF DONATIONS AND UNCONDITIONAL GRANTS  
YEAR ENDED SEPTEMBER 30, 2003

LIVESTOCK INDUSTRY	2003	2002
Beef		
British Columbia Cattlemen's Association	\$ -	\$ 5,000
Saskatchewan Horned Cattle Trust Fund	37,500	37,500
Kamloops Stockmen's Association	1,000	700
Saskatchewan Cattle Marketing Deductions Fund	180,000	180,000
Ontario Cattlemen's Association	2,000	-
Alberta Cattle Commission	10,000	-
Manitoba Cattle Producers Association	-	5,000
	<u>230,500</u>	<u>228,200</u>
Swine		
Alberta Pork	50,000	50,000
B.C. Hog Marketing Commission	2,500	-
Ontario Pork Producers Marketing Board	12,000	-
Manitoba Pork Council	25,000	25,000
Sask Pork	30,000	33,000
Swine Improvement Services Co-operative Ltd.	105	84
	<u>119,605</u>	<u>108,084</u>
Poultry		
Alberta Chicken Producers	-	6,900
	<u>-</u>	<u>6,900</u>
PROVINCIAL GOVERNMENTS		
British Columbia	5,700	700
Manitoba	15,200	15,200
	<u>20,900</u>	<u>15,900</u>
OTHER FOUNDATIONS, COMPANIES AND INDIVIDUALS		
Individuals	-	700
	<u>-</u>	<u>700</u>
<i>See accompanying notes</i>	<u>\$ 371,005</u>	<u>\$ 359,784</u>

VACCINE & INFECTIOUS DISEASE ORGANIZATION (VIDO)

Schedule 2

UNIVERSITY OF SASKATCHEWAN

SCHEDULE OF CONDITIONAL GRANTS AND CONTRACTS

YEAR ENDED SEPTEMBER 30, 2003

	September 30, 2002		2003	September 30, 2003		2003 Income	2002 Income
	Accounts Receivable	Unearned Revenue	Funds Received	Accounts Receivable	Unearned Revenue		
<b>Federal Departments and Agencies</b>							
Natural Sciences & Engineering Research Council of Canada (NSERC)							
Operating, Strategic and Equipment	\$ -	\$ 110,543	\$ 461,884	\$ -	\$ 76,597	\$ 495,830	\$ 740,151
Canadian Institutes of Health Research	-	653,052	684,198	-	468,616	868,634	481,882
Agriculture Canada/NSERC Research Partnership Grants	-	-	-	-	-	-	(7,637)
Canadian Bacterial Diseases Network (CBDN)	67,848	-	205,717	38,204	-	176,073	200,065
Agriculture and Agri-Food Canada	155,700	-	843,798	36,191	-	724,289	1,111,393
Public Works & Government Services Canada	-	-	-	7,900	-	7,900	-
Canada Research Chair							
Infrastructure	53,583	-	-	8,703	-	(44,880)	322,623
Operating	-	216,803	263,921	-	274,859	205,865	362,036
Research Network on Bacterial Pathogens of Swine	-	43,320	119,813	-	64,407	98,726	216,366
Canvac	-	83,421	51,831	64,501	-	199,753	276,054
Genome Canada	154,303	-	2,203,145	770,892	-	2,819,734	154,303
<b>Provincial Departments and Agencies</b>							
Saskatchewan Council for Community Development	112,643	-	300,000	120,170	-	307,527	347,515
Saskatchewan Department of Agriculture and Food	65,114	63,283	299,800	22,718	47,779	272,908	243,077
Agri-Food Innovation Fund	16,000	-	16,000	-	-	-	252,916
Health Services Utilization and Research Commission	-	473	20,000	-	16,079	4,394	68,503
Saskatchewan Health Research Foundation	-	50,147	85,739	-	51,095	84,791	70,340
Alberta Agriculture Research Institute (AARI)	2,450	24,591	2,450	-	-	24,591	158,074
Alberta Livestock Industry Development Fund Ltd.	-	-	100,510	-	97,680	2,830	-
Ontario Ministry of Agriculture & Food	-	-	5,603	38,782	-	44,385	-
Beef Cattle Industry Development Fund	12,422	-	31,708	-	6,995	12,291	38,669
Saskatchewan Beef Development Board	19,200	-	10,200	-	-	(9,000)	-
Beef Cattle Research Council	8,781	-	30,000	3,312	-	24,531	38,781
<b>Producer Groups</b>							
Ontario Cattlemen's Association	709	27,952	25,800	42,137	-	95,180	35,474
Poultry Industry Council	6,827	6,863	16,400	18,784	4,462	30,758	25,034
Alberta Beef Producers	-	-	75,000	-	43,252	31,748	-
<b>Other Agencies</b>							
Livestock Environmental Initiative	-	1,508	30,650	2,947	-	35,105	24,782
Michael Smith Foundation for Health Research	-	-	-	1,001	-	1,001	-
	<u>\$ 675,580</u>	<u>\$ 1,281,956</u>	<u>\$ 5,884,167</u>	<u>\$ 1,176,242</u>	<u>\$ 1,151,821</u>	<u>\$ 6,514,964</u>	<u>\$ 4,939,191</u>
<b>University of Saskatchewan</b>							
Indirect Cost of Research Allocation	\$ -	\$ -	\$ 50,000	\$ -	\$ -	\$ 50,000	\$ -
Canada Research Chair - Infrastructure	-	90,417	101,870	12,346	-	204,633	145,670
	<u>\$ -</u>	<u>\$ 90,417</u>	<u>\$ 151,870</u>	<u>\$ 12,346</u>	<u>\$ -</u>	<u>\$ 254,633</u>	<u>\$ 145,670</u>
	<u>\$ 675,580</u>	<u>\$ 1,372,373</u>	<u>\$ 6,036,037</u>	<u>\$ 1,188,588</u>	<u>\$ 1,151,821</u>	<u>\$ 6,769,597</u>	<u>\$ 5,084,861</u>

See accompanying notes

## RESEARCH COLLABORATORS

Dr. Kingsley Amoako - Canadian Food Inspection Agency, ADRI, Lethbridge, AB

Dr. Robert Anderson - Dept. of Microbiology and Immunology, Dalhousie University, Halifax, NS

Dr. Jean-Christophe Audonnet - Merial, Lyon, France

Dr. J. Bacha - Inimex Pharmaceuticals Inc., Vancouver, BC

Dr. C. Barnett - Intervet Inc., Millsboro, DE, USA

Dr. R. Bartenschlager - University of Hudeberg/Klinikum, Germany

Dr. T. Boon - Ludwig Institute for Cancer Research, Brussels, Belgium

Dr. R. Bratzler - Coley Pharmaceuticals, Wellesley, MA, USA

Dr. C. Breathnach - Dept. of Medical Sciences, University of Wisconsin, Madison, WI, USA

Dr. Bryce Buddle - AgResearch Wallaceville, Upper Hutt, New Zealand

Dr. M. Czub - Dept. of Health, Government of Canada, Winnipeg, MB

Centocor Inc. - Nalvern, PA, USA

Dr. Zhijie Chang - Tsinghua University, Beijing, People's Republic of China

Dr. Dirk Deregt - Canadian Food Inspection Agency, ADRI, Lethbridge, AB

Mr. Nelson Dinn - Agassiz Dairy Education and Research Centre, Agassiz, BC

Dr. Michael Fontaine - Moredun Research Institute, Penicuik, Scotland

Dr. Patrick Frenchick - Boehringer Ingelheim Vetmedica GmbH, Ingelheim am Rhein, Germany

Genome Canada - Ottawa, ON

Genome BC - Vancouver, BC

Genome Prairie - Calgary, AB

Dr. Marcelo Gottschalk - Université de Montréal, Montreal, QC

Dr. Sagar Goyal - University of Minnesota, Minneapolis, MN, USA

Dr. S. Griffin - Border Vet Animal Health Services, Carnduff, SK

Dr. Carlton Gyles - University of Guelph, Guelph, ON

Dr. Scott A. Halperin - Pediatrics, Dalhousie University, Halifax, NS

Dr. Beth Halperin - Pediatrics, Dalhousie University, Halifax, NS

Dr. Robert E.W. Hancock - Centre for Microbial Diseases and Immunity Research, University of British Columbia, Vancouver, BC

Dr. B. Harrach - Veterinary Medical Research Institute, Hungarian Academy of Sciences, Budapest, Hungary

Dr. Rolf Hecker - Qiagen/Merial, Düsseldorf, Germany

Dr. R. Holland - Intervet Inc., Millsboro, DE, USA

Dr. Mark Holmes - Dept. of Clinical Veterinary Medicine, University of Cambridge, Cambridge, UK

Dr. Mary Hondalus - Dept. of Immunology and Infectious Diseases, Harvard School of Public Health, Boston, MA, USA

Dr. Steve Hussey - Dept. of Medical Sciences, University of Wisconsin, Madison, WI, USA

Dr. John Hutcheson - Intervet Inc., Millsboro, DE, USA

Dr. M. Ishibashi - Osaka University, Kagawa, Japan

Dr. Mario Jacques - Université de Montréal, Montreal, QC

Dr. Hakan Janson - Malmo University Hospital, Lund University, Malmo, Sweden

Dr. Christiane Juhls - Mologen AG, Berlin, Germany

Dr. David Junker - Syntro, San Diego, CA, USA

Dr. Vivek Kapur - University of Minnesota, Minneapolis, MN, USA

Dr. John Kelly - Institute for Biological Sciences, National Research Council of Canada, Ottawa, ON

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## RESEARCH PUBLICATIONS IN SCIENTIFIC JOURNALS

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B.C. Hog Marketing Commission

Canada Foundation for Innovation

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Canadian Bacterial Diseases Network

Canadian Institutes of Health Research

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Genome Canada

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Ontario Ministry of Agriculture & Food

Ontario Pork Producers Marketing Board

Poultry Industry Council

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Province of Manitoba

Province of Saskatchewan

Public Works & Government Services Canada

Research Network on Bacterial Pathogens of Swine

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Saskatchewan Council for Community Development

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# Vaccine & Infectious Disease Organization