

V I D O



1987 - 88 ANNUAL REPORT



### **THE GOALS OF VIDO**

- 1) To serve the livestock industry through research on the common infectious diseases of farm animals and poultry.
- 2) To fill the gap between scientific discoveries in the laboratory and their practical application on the farm.
- 3) To use science, technology and innovation to improve the economic well-being of the agri-food system.
- 4) To help provide higher quality food to consumers through research on non-residue forming animal health products, preventive medicine programs and improved management techniques.
- 5) To reduce the suffering and wastage of animals caused by disease.
- 6) To market spin offs of the research to provide better human health products, and to improve public health by reducing diseases that are directly transmissible to man.

# V I D O

**I**n 1975, VIDO was established at the University of Saskatchewan in Saskatoon with a grant provided by the Devonian Group of Charitable Foundations of Calgary. The Foundation was joined by the Provinces of Saskatchewan and Alberta, and the University which supported the original development of the Organization. As a self-reliant Organization of the University, it receives on-going funding from governments, charitable foundations, the livestock and poultry industries, research grants, contracts and other private sources. The Provinces of Saskatchewan and Alberta, and the University of Saskatchewan continue to be important supporters of VIDO.

VIDO's mandate is to undertake research that will improve the economic well-being of the livestock and poultry industries by developing new, innovative, non-residue forming, animal health products, preventive medicine programs and improved management techniques.



*(Back Row - Left to Right)*

*P.G. Hodgman (Executive Officer),  
A. Rampton, E. Thiessen, G. Hamilton,  
R. Christian, S. Kramer, H. Fast*

*(Front Row - Left to Right)*

*B. Anderson, R. Church (Vice Chairman),  
R. Murray (Chairman), S.D. Acres  
(Director), C.L. Nicholls-Nixon  
(Manager, Financial Operations  
to June, 1988), W. Cochran*

*Missing - L.A. Babiuk (Associate  
Director, Research), R. Bailey,  
D. Rowlett, K.B. Barteski (Manager,  
Financial Operations from July, 1988)*



R.M. Murray  
Chairman



R.B. Church  
Vice Chairman

In my own words, paraphrased from VIDO's original goals, the following might be a suitable "Mission Statement" for the Organization:

(1) to do research on infectious diseases of farm livestock and poultry, (2) to contribute to improved production and management techniques, (3) to provide technology transfer between laboratory and farm, (4) to study the economic impact of animal diseases and thereby to:

- (a) reduce waste and increase the quantity and quality of animal protein food,
- (b) improve our understanding of the economics of animal disease,
- (c) improve farm income,
- (d) improve public health and,
- (e) reduce animal suffering caused by disease.

To assess the success of VIDO during its 1987-88 fiscal year, it is helpful to measure performance against these objectives.

Readers will thoroughly appreciate the extent of that success as they review the reports following, of the Director Dr. S.D. Acres, Associate Director (Research) Dr. L.A. Babiuk, Executive Officer Mr. P.G. Hodgman and Manager - Financial Operations, Mr. K.B. Barteski.

The assessment can only be: "Mission Accomplished".

This achievement has not been accidental.

It has been due rather to the successful acquisition and deployment of the resources necessary for success.

The 1987-88 fiscal year has seen the following evolution in VIDO resources.

**Physical Resources**

The development of the formerly unoccupied areas in the basement of the VIDO building has contributed much needed facilities for expanded research activity, especially as related to new contract research. Combined with the new Field Research Station which went on stream last year, the available facilities are, for at least the time being, adequate.

**Financial Resources**

With the continuing strong support of traditional backers (for which much credit is due to the efforts and fine communication skills of Executive Officer Paul Hodgman), to good research achievements, and to an expanded base of contract collaborators, VIDO is in probably the best financial shape in its history, and reasonably well situated for the needs of the immediate future.

**Human Resources**

The management group at VIDO have had outstanding success in gathering around them scientists and technicians who are admirably qualified to contribute in this area. Under the exceptionally able guidance of Director Dr. Stephen Acres and Associate Director (Research) Dr. Lorne Babiuk, they are making substantial contributions at the cutting edge of several areas of veterinary science.

Even the most high tech of operations must be conducted in a business like manner, and VIDO has been conscious of this need. During the year, Dr. Acres completed the Advanced Management Course offered by the Banff School of Advanced Management. The addition of Mr. Ken Barteski B. Comm. M.B.A., in the position of Manager - Financial Operations, to the existing experienced staff has substantially strengthened the administrative capabilities of the group.

Finally, it is worth repeating that (apart from the VIDO concept itself for which Dr. Christopher Bigland and his early collaborators deserve the honour) credit for the foregoing resides substantially with the key management team and the entire staff. I wish to express appreciation to all of them on behalf of the entire Board of Directors for their skills, dedication and hard work. To the Board Members, for their dedication and enlightened guidance and support, may I express my personal appreciation.

*Bob Murray*  
R.M. Murray

*PHYSICAL  
ENVIRONMENT*



*ETIOLOGIC  
TRIANGLE*



*BIOLOGICAL  
ENVIRONMENT  
(MICROBES)*



*HOST  
ANIMAL*



In this era of "high technology" it is sometimes easy to forget that efficient animal production relies on a complex set of factors. These factors are the biologic environment which is made up largely of infectious organisms, the physical environment and the host animal. They are often referred to as the "etiologic triangle" and are drawn as such to illustrate the fact that the status of each affects the other. In a broad sense, these are the three co-determinants of production efficiency.

In last year's Annual Report I spoke of the range of technology or research "tools" required to develop practical methods of improving the efficiency of livestock production. We are proud of the new "tools" we have developed in the areas of biotechnology and immunology and our application of them to animal diseases. These tools allow us to manipulate the infectious organisms which cause disease (Biologic Environment) and the immune response of the animals. Using them, we are developing faster, cheaper, and more reliable diagnostic methods, vaccines, and other biological methods of disease prevention.

We are equally proud of our work to control the Physical Environment in which livestock are raised, particularly through the development of improved housing and management systems. In past reports we have mentioned these aspects of our work but have not emphasized them. This year, we are highlighting new housing information, and particularly the achievements of the VIDO Swine Technical Group in the area of swine housing design and management.

Intensification of livestock production has created new challenges and problems in environmental and disease management. These are often in the form of "production diseases" which involve complex or multiple causes and which reduce the efficiency of livestock production. They include such diseases as Mycoplasma (enzootic) and Haemophilus pneumonia in swine, enzootic pneumonia in dairy calves, and neonatal diarrhea and other enteric diseases in all species. VIDO's objective is to provide "practical solutions" to these types of production diseases. Therefore, in addition to our work in immunobiology, we have always included research on improved management and housing systems in our research programs.

A major achievement during the past 5 years has been the publication of new housing information by the VIDO Swine Technical Group which was created in 1980. Since that time, the Group has been under the Chairmanship of Dr. Harold Fast who was then a Research Veterinarian with VIDO and who subsequently left the Organization to operate his own swine unit at Spiritwood, Saskatchewan. This multi-disciplinary group includes swine producers, veterinarians, agricultural engineers, nutritionists, and others interested in swine production. With financial support from VIDO, they meet several times a year to discuss the common problems of modern swine production.

The extremes of climate experienced in Canada, coupled with the demands of intensive swine production, create some unique environmental challenges for swine producers. Managing the "Physical Environment" component of the etiologic triangle becomes a major determinant of efficient swine production. Therefore, the Group has focused their multidisciplinary talents on solving some of these problems. Lead by Dennis Hodgkinson, an agricultural engineer with the Manitoba Department of Agriculture, the Group has published three booklets which describe the design, construction, and operation of nurseries, farrowing barns, and feeder barns. The details of these publications are outlined in the Report of the Associate Director (Research).

#### **Board of Directors**

The Board of Directors have again provided sound guidance and direction to the Organization. When VIDO was established 13 years ago, the make-up of the Board, which included five primary producers, two "at-large" members usually selected from the broad field of agri-business, three representatives from provincial and federal governments, and two representatives from the University of Saskatchewan, was a unique model. This system of bringing together outstanding individuals from a variety of public and private sectors has served VIDO well and is now being copied by many other groups and organizations across the country.

This year, I have the privilege of thanking retiring Board members Dr. Boyd Anderson, of Fir Mountain, Saskatchewan, and Mr. Rod Bailey of the Regional Development Branch of Agriculture Canada in Ottawa for their service to VIDO. At the same time, I am delighted to welcome



new members Mr. Garth Larson from Semans, Saskatchewan, and Dr. Clare Rennie from the Ontario Ministry of Agriculture and Food. I am also pleased that Dr. Don Rowlett, Vice President (Administration) of the University of Saskatchewan, was reappointed for an additional four-year term. I would also like to express my appreciation to Mr. Bob Murray of Brantford, Ontario for his energetic and encouraging guidance as Chairman of the Board, and to congratulate him on being re-elected for a second one-year term as Chairman.

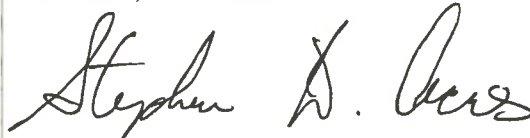
#### **Personnel**

Once again, I would like to acknowledge the contributions of each member of the VIDO staff. Research is not a 9 to 5 job. Experimental protocols, and our commitment to ensuring that animals are comfortably maintained demand that the Organization operate 365 days a year. Every staff member has contributed to the successful operation of the Organization and to the production of useful research results. The entire team deserves a hearty thank-you for a job well done.

I would also like to take this opportunity to thank Charlene Nicholls Nixon who resigned as Manager - Financial Operations to pursue a PhD degree in Strategic Management at the Krannert Graduate School of Management at Purdue University, and to wish her well in her studies. I welcome to the Management team, Mr. Ken Barteski (B.Comm., C.A.) who joined us in July. Ken brings a broad background in accounting and financial planning to the Organization. With his assistance, we look forward to another year of successful operations.

#### **Recognition**

Many members of the VIDO staff contribute to the livestock, veterinary and scientific communities by serving on a variety of advisory groups, boards, and review committees. I am pleased to report that this year, Paul Hodgman was designated an honorary life member by the Canadian Veterinary Medical Association "in recognition of distinguished service rendered by him to the veterinary profession." Paul served for five years as a member of the Board of Trustees of the Canadian Veterinary Research Trust Fund, and was chairman for two of those years. The CVMA allows only ten people who are not members of the profession to hold this honour at any given time. Congratulations Paul on a job well done.



S.D. Acres



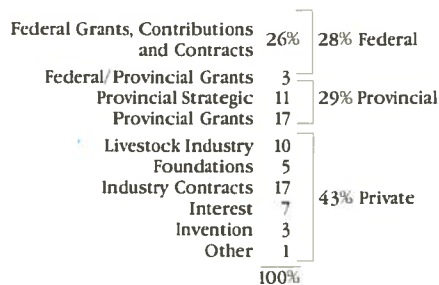
**Funding, Contributions and Grants**

VIDO's research continues to be supported from a broad and varied funding base. Donations, contracts, grants and other financial sources such as investments and invention revenue, all contribute to our operating funds. Specific information and the various sources are shown in the audited Financial Statements for 1987-88 found elsewhere in this Annual Report.

Funds from the livestock industry are critical to our success. These donations confirm producer support for research on various problems. In turn, they enable us to obtain additional funds and "leaver up" monies from other sources. VIDO is very appreciative of the continued contributions from producer boards, commissions and organizations across Canada. Saskatchewan cattle producers (both beef and dairy) through the Saskatchewan Cattle Marketing Deductions Fund, are now our largest livestock supporters. The livestock industry support for the 5 year period 1983-1988 was \$1,134,945.

VIDO has been very successful over the past 5 years in attracting a total of \$12,125,125 for operating revenue. Below is a chart showing the breakdown by sector for the period 1983-1988. Of particular note is the percentage of "private" source funds that VIDO accesses. Ten years ago virtually all of our funds came from the "public" sector. This has now decreased significantly with 43% of all VIDO revenues coming from various "private" sources.

**VIDO Operating Revenue by Sector  
1983-1988  
\$12,125,125**



**Lower Level Development**

The scope of our research and the size of our scientific and technical staff continues to grow. In September, an additional 10,600 square feet (985 square metres) of new laboratory and office space in our basement was opened. This new development is primarily devoted to immunology research on lymphokines for CIBA-GEIGY Canada Ltd., and includes two large immunology laboratories, one general purpose laboratory, cold room, fermentor space, glassware preparation, other specialty equipment rooms plus offices.

The new space will enable us to maintain our position on the cutting edge as an immunobiology research and development Organization. We feel that immunology along with biotechnology will lead to the future development of new technology and products for the industry. Unfortunately, all our existing space in the building is now dedicated and there is no room for more facilities to be built. Further growth may have to entail building a new wing on the VIDO premises.

**Communications and New Livestock Symbols**

On the cover of this Annual Report, you will note four new symbols depicting beef cattle, dairy cattle, swine and poultry. These new symbols will be used to identify VIDO publications such as Fact Sheets, Technical Bulletins and other information for the livestock industry.

In the next year, we will revise our BVD Fact Sheet and develop a new one for the poultry industry on Infectious Bursal Disease. Also under consideration is a new Fact Sheet on *Haemophilus somnus* in beef cattle and a revision of the Swine Nursery Design Technical Bulletin. These will be made available to the public as they become available.



P.G. Hodgman





## VIDO Swine Technical Group Members

Stephen Acres  
Director  
VIDO

\*Joel Allan  
Producer  
Lumby, B.C.

Ernie Barber  
Engineer  
University of Saskatchewan  
Saskatoon, Saskatchewan

Roy Barrett  
Producer  
Ponoka, Alberta

Stewart Bauck  
Veterinarian,  
MSD Ag Vet  
New Jersey, USA

Chris Bigland  
Past Director  
VIDO

Bob Brad  
Producer  
Vermillion, Alberta

\*Chris Byra  
Veterinarian  
Chilliwack, B.C.

Bruce Creighton  
Nutritionist  
Shur Gain Feeds  
Edmonton, Alberta

\*Meriel Cromarty  
Wood Lynn Farms  
Delaware, Ontario

\*Harold Fast  
Chairman  
VIDO Swine Technical Group  
Producer  
Spiritwood, Saskatchewan

\*Clarence Froese  
Nutritionist  
Manitoba Agriculture  
Winnipeg, Manitoba

Peter Hill  
Producer  
Langley, B.C.

\*Dennis Hodgkinson  
Engineer  
Manitoba Agriculture  
Winnipeg, Manitoba

Paul Hodgman  
Executive Officer  
VIDO

\*Burt Jorgenson  
Producer  
New Brigiden, Alberta

Roy Kelly  
Veterinarian, W.C.V.M.  
Saskatoon, Saskatchewan

Don Kolla  
Producer  
Cudworth, Saskatchewan

Nancy Lidster  
Producer  
Whitefox, Saskatchewan

Don Lidster  
Producer  
Whitefox, Saskatchewan

Herm Martens  
Producer  
Rosenort, Manitoba

Vern Meek  
Producer  
Acme, Alberta

Dudley Osborne  
Microbiologist, W.C.V.M.  
Saskatoon, Saskatchewan

\*John Patience  
Nutritionist  
Prairie Swine Center  
Saskatoon, Saskatchewan

Dave Paton  
Veterinarian  
Aldergrove, B.C.

\*Richard Quiring  
Producer  
Hepburn, Saskatchewan

Allen Reimer  
Producer  
Steinbach, Manitoba

\*Art Rempel  
Producer  
Grande Prairie, Alberta

Ron Rempel  
Producer  
Ste. Anne, Manitoba

Dick Roney  
Producer  
Turtleford, Saskatchewan

Mike Sheridan  
Veterinarian  
Steinbach, Manitoba

John Strokappe  
Veterinarian  
Red Deer, Alberta

Roger Thibault  
Producer  
St. Benedict, Saskatchewan

John Toews  
Producer  
Aldergrove, B.C.

\*Paul Vielfaure  
Producer  
La Broquerie, Manitoba

\*Phil Willson  
Research Veterinarian  
VIDO

\*Present Member

REPORT FROM THE ASSOCIATE DIRECTOR  
(RESEARCH)

As pointed out in the Director's Report, the theme of this year's Annual Report is housing and management. This is an important area for additional research because the effects of the environment on livestock performance have been well documented. The physical environment influences the pathogenic organisms in the environment as well as the animal's defences. Therefore, if the physical environment is poor, it predisposes the animal to the pathogenic effects of disease agents. As a result, survival, growth rates, efficiency of feed conversion and reproductive performance are all impaired.

Infectious diseases are our major focus and therefore we must deal with pathogenic micro-organisms which cause them. The original source of a pathogen is usually an infected animal. Infectious organisms multiply in infected animals, particularly those which are clinically ill, and are shed in exhaled air, feces, urine, or by direct contact. In large part, it is the physical environment which determines whether a pathogen will survive outside of the host animal, spread to other animals, and cause disease. Crowding tends to enhance the spread of infectious organisms from animal to animal by direct contact. However, the physical environment is also crucial in determining the extent to which indirect spread occurs via such factors as dust, utensils, waste water and manure.

The virulence, or ability of an infectious organism to cause disease, cannot usually be altered by changing the physical environment. Therefore, in manipulating the environment, we are usually attempting to reduce the dose of infectious organisms to which animals are exposed, or to reduce stressors which decrease the animal's resistance to infectious disease.

A.J.F. Webster, from the Department of Animal Husbandry at the University of Bristol in England, uses four criteria to define a satisfactory environment: thermal comfort, physical comfort, disease control, and behaviour satisfaction. Intensification of swine production has made it more difficult to meet these four criteria. Based on practical experience and observations, members of the *Swine Technical Group* recognized that new information was necessary in the area of swine housing. Therefore, they set out to assemble practical information which could be applied on the farm by swine producers. The result is a series of three publications on nurseries, farrowing barns, and feeder barns.

In preparing these publications we wanted to achieve two objectives. The first was to focus attention on the need for improved animal housing systems, to both improve performance and to enhance the comfort and welfare of the animals. The second was to provide producers with a single reference, which not only discussed the design and construction of the facilities, but which also present clear and concise information on how to manage the facilities and their occupants.

The result is a series of three clear, concise, and practical publications. Each one discusses the design, construction, and management of specialized swine units.

The technical bulletins are as follows:

- Swine Nursery Design
- Farrowing Barn Design & Management
- Feeder Barn Design & Management

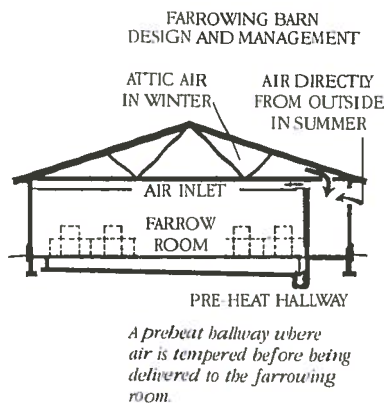


### Swine Nursery Design

This publication describes the design and management of nursery systems for 3 to 9 week old pigs. It includes information on a variety of topics including the number and size of rooms and pens required for different sized units, a variety of floor plans, and manure handling systems. Detailed information is provided on pen shape, construction material, and the proper location of feeders and waterers. An entire chapter is devoted to the health benefits of All In - All Out systems and another to feeding of the early weaned pig. The first hand experiences of three producers who have used All In - All Out nurseries are described in another chapter. Finally, performance standards and production targets for weaned pigs are summarized. The first edition is currently being revised.

### Farrowing Barn Design and Management

This publication describes the design, construction and management of a modern All In - All Out farrowing facility and the care and feeding of the farrowing sow and her pigs. Planning and building the farrowing barn are highlighted, with emphasis on sanitation, creating the optimum environment, and reducing disease transmission. The lay-out and flow of animals through the facility are described in detail with special tips on large and small production units. Special emphasis is placed on farrowing crate design and construction materials including flooring. Chapters are devoted to insulating and ventilating the facility, and operating and managing the barn. Special sections are devoted to such topics as farrowing tips, cross-fostering, nutrition of the lactating sow, preparing sows for rebreeding, and causes of preweaning mortality.



### Feeder Barn Design and Management

The proper feeding, housing and care of the feeder pig in a modern grower-finisher facility is discussed in detail. The first section describes designing and operating the feeder barn and includes such topics as selecting suitable materials, designing the pig rest area, choosing the penning materials, picking a feeder, and sizing the facility. Section 2 is again devoted to ventilation with emphasis on topics such as choosing the best temperature, how humidity effects ventilation rate, choosing exhaust fans, and the right controls and monitors.

Section 3 focuses on feeding and highlights such aspects as meeting the pig's energy requirements, checking protein content, the facts on feed additives, adjusting self-feeders, and the pros and cons of liquid feed. Monitoring production, another essential of modern swine husbandry, is emphasized in Section 4. Section 5 concentrates on health and pig care with special tips on treating disease, identifying herd-health status, practical trucking tips, pen checking, and better ways to market pigs.

All of these publications are well illustrated with figures, tables, and photographs. They provide a quick but thorough reference source for producers interested in building new facilities or upgrading existing facilities. They emphasize the point that producers need to take extra time when selecting and building facilities because well-planned, functional facilities can enhance animal performance, reduce stress, and make raising pigs easier and more profitable. The VIDO Swine Technical Group is confident that producers can use these books to develop more efficient and profitable operations.

### Update on Subunit Vaccine Development

Last year we highlighted the biotechnological approaches we are using in the development of subunit vaccines. We feel that such approaches are the wave of the future and that many of the new products for animal and human health will be produced or improved by the use of biotechnology. I do not intend to repeat in this report how biotechnology is used in vaccine production, but will provide a very brief update on the progress made at VIDO during the past year in developing several vaccines. The vaccines we are presently working on include bovine herpesvirus-1, *Pasteurella haemolytica*, bovine rotavirus, bovine coronavirus and *Actinobacillus pleuropneumoniae* (*Haemophilus pleuropneumoniae*). In addition we are in the process of initiating a new project on *E. coli* which causes colisepticemia in turkeys. Regardless of whether the disease-causing organism is a virus or bacteria, the steps involved in developing a subunit vaccine are similar and include:

- 1) identification of the disease-causing organism,
- 2) determining whether recovery from infection provides protection from subsequent disease,
- 3) identifying the virulence factors and/or protective components of the disease-causing organism,
- 4) producing the protective components by biotechnology,
- 5) confirming the protective capacity of the subunits in the host animal, and
- 6) formulating the vaccine.

In all of the cases, with the exception of *Haemophilus pleuropneumoniae*, we have identified the protective components and produced them by recombinant DNA technology. During the next year we will be conducting studies (step 5) to confirm whether the subunit vaccines are protective in animal model systems, as well as under field conditions. In parallel with these studies, we will be formulating the protective proteins, into final products. Based on our progress to date, it is hoped

that many of these vaccines will be tested under field conditions (field trials) during the next fiscal year, and some should be licensed by 1990.

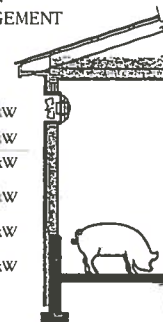
In addition to conducting research in-house, into new technologies for developing subunit vaccines, our scientists have been collaborating with individuals at the Biotechnology Research Institute (BRI) in Montreal. Together, they have been developing methods to produce viral subunit vaccines in an insect cell system. One of the major advantages of this type of expression system is its economics and safety. This collaboration is continuing and expanding to include methods whereby large quantities of the individual proteins can be produced economically (scale up) in these insect cell systems. In addition to investigating insect cells as "factories" for the subunit vaccines we are developing, mammalian cell systems for vaccine production. In this regard we have combined our expertise in conventional virology, where we grow cells on microcarriers or beads, with molecular biology to generate large numbers of animal cells producing the specific individual vaccine candidates in culture. The above methods of production are most useful for viral vaccines. In the case of bacterial vaccines we have been producing vaccine subunits in *E. coli*. Using this system we can now produce enough protein in a 100 L fermenter to immunize 500,000 animals. This demonstrates the economics of producing vaccines by these methods. During the next year we will continue to improve production yields and investigate the best methods for purification and formulation of these specific vaccines for use in animals.

### Licensed Vaccine - HEVLAN™

Previously we had reported on the licensing of the Hemorrhagic Enteritis virus vaccine and its significant impact on reduction of adenovirus infections in turkeys. The first generation vaccine needed to be

### FEEDER BARN DESIGN AND MANAGEMENT

Heat Loss	
BUILDING	9kW
VENTILATION	33kW
TOTAL	42kW
HEAT FROM PIGS (350 pigs, 60 kg)	29kW
NFT HEAT LOSS	13kW
SUPPLEMENTARY HEAT NEEDED	13kW



*The balance between building and ventilation heat losses and heat produced by pigs dictates the need for supplementary heat.*



kept frozen to maintain its viability. This obviously was not the ideal method of maintaining a vaccine and considerable problems were encountered in shipping and storage. To overcome these deficiencies, we spent a considerable amount of time during the past year to develop a freeze-dried version of the HEV vaccine that does not need to be frozen. This has been accomplished and the second generation hemorrhagic enteritis vaccine is presently being marketed by Langford Inc. of Guelph, Ontario under the tradename HEVIAN<sup>TM</sup>.

### **Cytokines**

In addition to developing subunit vaccines, VIDO has continued to investigate various ways of enhancing immunity in animals using a series of natural compounds, produced by recombinant DNA technology called cytokines. Some of the best known cytokines are interferons and interleukins. These cytokines can be used in conjunction with vaccines to enhance immune responses to the vaccines, or they may be used as prophylactic methods to increase the animals' resistance to infection under field conditions. These studies are encouraging in that we have demonstrated success in enhancing animals' resistance to respiratory disease infections. One advantage of using these naturally produced immunomodulators for the control of infectious diseases is that they do not result in residues in meat or milk. Furthermore these cytokines can induce instant protection as compared to vaccination which requires 2 to 3 weeks before maximal protection occurs. Thus, the two approaches are complementary.

### **Manpower and Training**

During the early years of VIDO's development, it was clearly recognized that there was a shortage of well trained researchers interested in pursuing investigations in the areas of pathogenesis of infectious diseases. As a result, VIDO has attempted to alleviate this shortage by training talen-

ted young individuals in the areas of microbiology and infectious disease research. At present, five Ph.D. students are conducting their research at VIDO in various areas of microbiology and immunology.

As a further indication of VIDO's commitment to graduate education, the Board of Directors and Management of VIDO, together with the University of Saskatchewan have established the C.H. Bigland Fellowship Fund to acknowledge the founder and first Director of VIDO, Dr. Chris Bigland. The intent was to establish a fund so that the principle, plus accumulated interest would provide graduate student stipends for a period of 10 years. I am happy to report that the \$150,000 goal has been achieved, and it is anticipated that the first Bigland Fellow will begin studies during the 1989-90 academic year. Although the candidate will have to conduct his research on some aspect of infectious disease of interest to VIDO, the candidate can pursue his graduate training at any institution or department providing suitable training in the selected discipline.

In closing I would like to extend my thanks to the dedication of all the individuals working at VIDO who have made this past year an extremely successful one. The support of the numerous organizations and granting agencies who have provided financial support to continue the exciting research we have done during the past year is acknowledged. Without the financial support and dedication of VIDO staff, none of the achievements of the past year or the future achievements would be possible.

L.A. Babiuik



R E P O R T F R O M T H E M A N A G E R  
F I N A N C I A L O P E R A T I O N S

**Financial Review**

VIDO reported total income of \$3,277,338 in fiscal 1988, an increase of 6.2% over the \$3,086,731 achieved in 1987. The 1988 growth in income was achieved by an increase in conditional grants, as summarized in Schedule 2 of the Audited Financial Statements, and license fees.

Total expenditures in fiscal 1988 were 3.6% less than in 1987. Excess of income over expenditure for the year was \$374,861 in 1988 as compared to \$77,117 in 1987. Of this excess, \$242,465 was appropriation to the Capital Trust and the Research Trust Fund balance decreased by \$145,136 in 1987. The balance in the Research Trust Fund is presently \$1,497,048 or 51.6% of 1988 expenditures.

The construction of an additional 10,000 square feet of research facilities in the lower level of the building was completed during 1988. The total cost of this development is to be financed by appropriations from the Research Trust. Income from existing research contracts designated for this purpose is transferred to the Capital Trust as the income on the contracts is earned. At September 30, 1988 \$464,720 had been transferred in this respect. Additional amounts will be transferred in 1989 and 1990 to fund the remaining construction costs of \$330,456.

The completion of these new research facilities will result in the hiring of additional staff. This will require that VIDO continue its drive for new and innovative sources of income in order that the anticipated increased level of research activity be adequately funded.

On a personal note, I assumed the position of Manager - Financial Operations of VIDO on July 12, 1988. The period since then has been a challenging and most rewarding one. My task, however, has been eased considerably by the co-operation and assistance I have been afforded by everyone at VIDO. Working in an organization as vibrant and dynamic as VIDO is truly an enriching experience.

*Ken Barteski*

K.B. Barteski



## Auditors' Report

To the Board of Directors of the Veterinary Infectious Disease Organization (V.I.D.O.), University of Saskatchewan:

We have examined the combined balance sheet of the University of Saskatchewan - Veterinary Infectious Disease Organization for the year ended September 30, 1988 and the statements of income, expenditure and fund balance (Research Trust and Capital Trust) and combined statement of changes in financial position for the year then ended. Our examination was made in accordance with generally accepted auditing standards and accordingly included such tests and other procedures as we considered necessary in the circumstances, except as explained in the following paragraph.

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 the financial position of the University of Saskatchewan - Veterinary Infectious Disease Organization as at September 30, 1988 and the results of its operations and the changes in its financial position for the year then ended in accordance with accounting policies described in Note 2 applied on a basis consistent with that of the preceding year.

*Deloitte Hashino & Sells*

Chartered Accountants

December 16, 1988

Saskatoon, Saskatchewan

University of Saskatchewan  
Veterinary Infectious Disease Organization (V.I.D.O.)

## Combined Balance Sheet

September 30, 1988	1988	1987
<b>ASSETS</b>		
<b>Current Assets</b>		
Cash on hand	\$ 25,000	\$ 34,434
Funds held by University of Saskatchewan	860,282	1,010,812
Due from University of Saskatchewan - operating fund	486,612	333,804
Accounts receivable (Note 3)	446,609	771,436
Inventories (Note 4)	76,527	55,476
	<u>1,895,030</u>	<u>2,205,962</u>
<b>Investments</b> (quoted market value \$826,608; 1987 - \$798,058)	832,929	824,285
<b>Plant Assets</b>		
Site and improvements	136,215	133,765
Furnishings, fixtures and equipment	438,763	431,351
Buildings and facilities	4,966,996	4,159,652
	<u>5,541,974</u>	<u>4,724,768</u>
	<u>\$8,269,933</u>	<u>\$7,755,015</u>
<b>LIABILITIES</b>		
<b>Current Liabilities</b>		
Accounts payable	\$ 97,818	\$ 24,758
Deferred revenue (Note 5)	1,259,051	1,258,848
Due to University of Saskatchewan - capital fund	79,498	32,835
Current portion of loan payable	25,000	25,000
	<u>1,461,367</u>	<u>1,341,441</u>
<b>Loan Payable (Note 6)</b>	<u>100,000</u>	<u>125,000</u>
	<u>1,561,367</u>	<u>1,466,441</u>
<b>EQUITY</b>		
<b>Capital Assets</b>	5,541,974	4,724,768
<b>Research Trust</b>	1,497,048	1,364,652
<b>Capital Trust</b>	(330,456)	199,154
	<u>6,708,566</u>	<u>6,288,574</u>
	<u>\$8,269,933</u>	<u>\$7,755,015</u>

## Research Trust

### Statement of Income, Expenditure and Fund Balance

Year Ended September 30, 1988

1988

1987

#### Income

Donations and unconditional grants (Schedule 1)

Livestock industry - dairy	\$ 62,000	\$ 62,000
- beef	141,000	115,500
- swine	98,069	97,413
Provincial governments	395,900	421,000
Other individuals, companies and foundations	3,805	3,969
	<u>700,774</u>	<u>699,882</u>

Conditional grants (Schedule 2)

Contract research	1,498,149	1,408,314
Contract services	652,963	636,093
Royalties	43,608	32,725
Interest	51,633	42,289
Animal services	143,907	143,345
License fees	40,464	30,184
Miscellaneous	113,186	65,000
	32,654	28,899
	<u>3,277,338</u>	<u>3,086,731</u>

#### Expenditure

Salaries and fringe benefits	1,183,249	1,116,117
Materials and supplies	686,440	468,932
Animal services	327,068	146,303
Equipment	373,029	634,981
Travel	109,406	114,532
Facilities and improvements	—	175,547
Other (Note 7)	223,285	353,202
	<u>2,902,477</u>	<u>3,009,614</u>

**Excess of Income Over Expenditure**

374,861 77,117

**Fund Balance, Beginning of Year**

1,364,652 1,509,790

1,739,513 1,586,907

**Transfer to Capital Trust**

(242,465) (222,255)

**Fund Balance, End of Year**

\$1,497,048 \$1,364,652

## Capital Trust

Statement of Income, Expenditure and Fund Balance

Year Ended September 30, 1988	1988	1987
<b>Income</b>		
Interest	\$ 45,131	\$ 10,112
<b>Expenditure</b>		
Site and improvements	2,450	—
Furnishings, fixtures and equipment	7,412	84
Buildings	807,344	37,378
	817,206	37,462
<b>Excess of Expenditure Over Income</b>	(772,075)	(27,350)
<b>Fund Balance, Beginning of Year</b>	199,154	4,249
	(572,921)	(23,101)
<b>Transfer From Research Trust</b>	242,465	222,255
<b>Fund Balance, End of Year (Note 8)</b>	<u>\$ (330,456)</u>	<u>\$ 199,154</u>

## Combined Statement of Changes in Financial Position

Year Ended September 30, 1988	1988	1987
<b>Operating Activities</b>		
Working capital from operations		
Research Trust excess of income over expenditure	\$ 374,861	\$ 77,117
Changes in non-cash operating working capital		
Due from University of Saskatchewan	(106,145)	(155,201)
Accounts Receivable	324,827	(484,022)
Inventories	(21,051)	1,626
Prepaid expenses	—	16,000
Accounts payable	73,060	21,396
Deferred revenue	203	913,334
Cash provided by operating activities	645,755	390,250
<b>Investing Activities</b>		
Additions to investments	(8,644)	(287,972)
Capital Trust excess of expenditure over income	(772,075)	(27,350)
Cash used in investing activities	(780,719)	(315,322)
<b>Financing Activities</b>		
Proceeds from loan	—	150,000
Repayment of loan payable	(25,000)	—
Cash (used in) provided by financing activities	(25,000)	150,000
<b>(Decrease) Increase in Cash</b>	(159,964)	224,928
<b>Cash, Beginning of Year</b>	1,045,246	820,318
<b>Cash, End of Year</b>	<u>\$ 885,282</u>	<u>\$ 1,045,246</u>

Cash represents funds held by the University of Saskatchewan and cash on hand.

# Notes to the Financial Statements

September 30, 1988

## 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 of 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" to reflect 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 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 balance sheet and statement of changes in financial position have been presented on a combined basis reflecting the activities of both funds.

### Capital assets

Capital assets are recorded as Capital Trust expenditures when purchased. The same assets are included in the balance sheet as plant assets offset by the "equity in capital assets" 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 are valued at the lower of cost and net realizable value.

### Investments

Investments are recorded at cost. The difference between cost and par value of bonds is not amortized but is treated as income or expense in the year of disposal.

### 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.

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

### License Fees and Royalties

License fees and royalties are recognized as they are received or earned under the terms of the agreements with licensees.

## 3. Accounts Receivable

	1988	1987
License Fees	\$ —	\$ 65,000
Royalties	22,437	16,000
Unconditional grantors and donors	—	155,500
Conditional grants (Schedule 2)	234,729	135,559
Contract research	134,455	366,430
Service contracts	31,896	17,391
Accrued interest	23,092	15,556
	<u>\$446,609</u>	<u>\$771,436</u>

## 4. Inventories

	1988	1987
Animals	\$49,256	\$ 8,956
Materials and supplies	27,271	46,520
	<u>\$76,527</u>	<u>\$55,476</u>

## 5. Deferred Revenue

	1988	1987
Conditional grants (Schedule 2)	\$ 795,497	\$ 709,262
Contract research	289,004	525,166
Donations and unconditional grants	174,550	24,420
	<u>\$1,259,051</u>	<u>\$1,258,848</u>

## 6. Loan Payable

The loan payable is interest free and is repayable to the University of Saskatchewan in equal installments of \$25,000 per annum ending October 1, 1993.

## 7. Other Expenditures

Other expenditures consist of V.I.D.O. operating accounts which include project expenses, maintenance, equipment rental, recruiting expenses, professional fees and board expenses.

## 8. Capital Trust - Fund Balance

During the year the Organization completed the development of research facilities in the lower level of the building. Construction costs are being financed through appropriations from the V.I.D.O. Research Trust over a four year period beginning in 1987. At September 30, 1988 the costs of this development exceeded the appropriations from the Research Trust by \$330,456. Additional appropriations will be made from the Research Trust as income from existing research contracts designated for this purpose is earned.

## 9. Related Party Transactions

a) V.I.D.O. 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 V.I.D.O. 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 owns 82% of a company called BIOSTAR Inc. whose primary purpose is to assist V.I.D.O. in both research and development of its products and technologies. During the year V.I.D.O. had the following transactions with BIOSTAR:

	1988	1987
<b>Income from BIOSTAR Inc. to V.I.D.O.</b>		
Contract research	\$82,712	\$231,806
Rent, office services and management fees	43,608	32,725
Material purchases	4,578	1,269
Sponsorship of two industrial research chairs at V.I.D.O. in conjunction with NSERC	24,467	45,483
<b>Expenditure by V.I.D.O. to BIOSTAR Inc.</b>		
Management service fees	35,267	18,425
Equipment lease	—	14,766

At September 30, 1988 the Organization has a receivable from BIOSTAR Inc. of \$68,981 (1987 \$51,269).

## 10. Comparative Figures

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

Schedule 1

**Schedule of Donations and Unconditional Grants**

Year Ended September 30, 1988	1988	1987
<b>Livestock Industry</b>		
Dairy		
Saskatchewan Dairy Producers Cooperative Limited	\$ 50,000	\$ 50,000
The Manitoba Milk Producers' Marketing Board	10,000	10,000
The Alberta Milk Producers' Association Ltd.	1,000	1,000
Northern Alberta Dairy Pool Limited	—	1,000
Fraser Valley Milk Producers Cooperative Association	1,000	—
	<u>62,000</u>	<u>62,000</u>
Beef		
Saskatchewan Cattle Marketing Deductions Fund	75,000	50,000
British Columbia Cattlemen's Association	5,000	5,000
Kamloops Stockmen's Association	700	500
Alberta Cattle Commission	60,000	60,000
Western Stock Growers' Association	300	—
	<u>141,000</u>	<u>115,500</u>
Swine		
Alberta Pork Producer's Marketing Board	41,659	41,336
Saskatchewan Pork Producers Marketing Board	16,885	16,739
Manitoba Hog Producers' Marketing Board	34,525	34,338
B.C. Hog Marketing Commission	5,000	5,000
	<u>98,069</u>	<u>97,413</u>
<b>Provincial Governments</b>		
Saskatchewan - Agricultural Development Fund	300,000	300,000
Alberta	75,400	100,000
British Columbia	5,000	5,500
Manitoba	15,500	15,500
	<u>395,900</u>	<u>421,000</u>
<b>Other Individuals, Companies and Foundations</b>		
Swine Improvement Services Co-operative (SISCO)	3,305	1,469
Richardson Century Fund	500	—
United Grain Growers Limited	—	2,500
	<u>3,805</u>	<u>3,969</u>
	<u>\$700,774</u>	<u>\$699,882</u>

Schedule 2

**Schedule of Conditional Grants**

Year Ended September 30, 1988	September 30, 1987		1988 Funds Received	September 30, 1988		1988 Income	1987 Income
	Accounts Receivable	Deferred Revenue		Accounts Receivable	Deferred Revenue		
Natural Sciences and Engineering Research Council of Canada (NSERC)							
- Co-operative Research Development Agreement	\$ —	\$ 409,220	\$ 700,000	\$ —	\$ 596,273	\$ 512,947	\$ 390,780
- Industrial Research Chairs	—	92,600	147,976	—	30,680	209,896	185,200
- Operating, strategic and equipment	—	80,750	246,867	—	79,300	248,317	242,200
BIOSTAR Inc. - NSERC Industrial Research Chairs	—	23,279	36,994	—	35,806	24,467	45,483
Farming for the Future Council of Alberta	—	39,829	—	—	—	39,829	10,171
Province of Ontario (OMAF) and Agriculture							
Research Institute of Ontario	19,952	—	55,667	91,009	—	126,724	19,952
Canada-Manitoba Agri-Food Development Agreement	25,874	—	56,560	25,704	—	56,390	67,432
Canada-Saskatchewan Sub Agreement on Agriculture (ERDA)							
Saskatchewan Agriculture - Agriculture Development Fund	37,500	54,877	87,500	37,500	52,520	89,857	75,757
Agriculture Canada - Livestock Productivity Improvement Program	50,000	8,707	100,000	50,000	918	107,789	117,504
National Research Council (NRC)	2,233	—	38,650	30,516	—	66,933	138,086
Saskatchewan Agriculture Research Fund (SARF)	—	—	15,000	—	—	15,000	14,500
	<u>\$ 135,559</u>	<u>\$ 709,262</u>	<u>\$1,485,214</u>	<u>\$ 234,729</u>	<u>\$ 795,497</u>	<u>\$1,498,149</u>	<u>\$1,408,314</u>

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## Research Collaborators

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Dr. Lawrence Thompson, Plant Biotechnology Institute, National Research Council, Saskatoon, Saskatchewan.

Dr. Tim Zamb, University of Nebraska, Lincoln, Nebraska, U.S.A.



## Guests to VIDO Board Banquets

### Winnipeg Meeting — January 29, 1988

**Joe Dunsmore**  
General Manager  
Manitoba Beef Commission

**Rudy Usick**  
Chairman  
Manitoba Beef Commission

**Ed Waddell**  
Regal Feeds - Landmark Feed Group, Manitoba

**Dr. Norman Stanger**  
Department of Animal Science  
University of Manitoba

**Brent Dornian**  
Pioneer Grain Co. Ltd. and  
Richardson Century Fund

**Dr. Ron McLaren**  
Feed Rite Mills, Manitoba

**Dr. Bob Richmond**  
Livestock Specialist  
Manitoba Department of Agriculture

**Orly Friesen**  
Head of Engineering Branch  
Manitoba Department of Agriculture

**Charlotte Oleson**  
MLA, Manitoba

**Dr. R. Grandhi**  
Research Scientist  
Brandon Research Station  
Agriculture Canada

**Dr. Frank Baker**  
Director  
Animal Industry Branch  
University of Manitoba

**Dr. R. Finley**  
Director  
Federal Animal Pathology Laboratory  
Agriculture Canada

**Dr. R.C. McGinnis**  
Dean  
Faculty of Agriculture  
University of Manitoba

**Dr. Robert Parker**  
Associate Dean  
Faculty of Agriculture  
University of Manitoba

**Diane Wreford**  
CBC, Winnipeg

**Les Kletke**  
Farm Director  
CFAM, CJRB, CHSM, Manitoba

**Tom Pringle**  
Assistant Deputy Minister  
Manitoba Department of Agriculture

**Dr. Frank Juck**  
Clinical Pathology & Toxicology  
Manitoba Diagnostic Laboratory

**Dr. Claude Mason**  
Neverville Feeds, Manitoba

**Allen Reimer**  
Steinbach, Manitoba  
(Member VIDO Swine Technical Group)

**Paul Vielfaure**  
La Broquerie, Manitoba  
(Member VIDO Swine Technical Group)

**Henk Steenge**  
Production Supervisor  
Shur Gain Division  
Canada Packers Inc., Manitoba

**Dr. Mary Ann Millar**  
Manitoba Veterinary Medical Association

**Dr. Gopi Nayar**  
Chief Microbiologist  
Manitoba Diagnostic Laboratory

**Dr. Jack McPhedran**  
Director  
Veterinary Services Branch  
Manitoba Department of Agriculture

**Mary Ellison**  
General Manager  
Manitoba Cattle Producers Association

**Larry Sedgewick**  
General Manager  
Manitoba Hog Producers Marketing Board

**Doug Head**  
Director  
Manitoba Hog Producers Marketing Board

**Weldon Newton**  
Director  
Manitoba Hog Producers Marketing Board

**Gordon Ferriss**  
Director  
Manitoba Hog Producers Marketing Board

**Ken Foster**  
Director  
Manitoba Hog Producers Marketing Board

**Ben Wips**  
Director  
Manitoba Hog Producers Marketing Board

**Burt Waters**  
General Manager  
Manitoba Chicken Broiler and  
Turkey Producers Marketing Board

**Waldie Klassen**  
Chairman  
Manitoba Chicken Broiler Producers  
Marketing Board

**Bob Byle**  
Chairman  
Manitoba Turkey Producers Marketing Board

**Delia Tetrash**  
Manitoba Egg Producers Marketing Board

**Paul Riese**  
President  
Designed Genetics Inc.  
(Past Member VIDO Board of Directors)

**Harold Dodds**  
Publisher  
Public Press

**David Wreford**  
Editor  
Country Guide

**Ron Manness**  
Manager  
United Grain Growers Red River Feedlot

**James Wade**  
General Manager  
Manitoba Milk Producers Marketing Board

**Russ Scott**  
Manager  
Manitoba Broiler Hatching Egg Commission

**David Wilkins**  
Country Guide

**Gren Winslow**  
Editor  
Cattlemen Magazine

**Jim Wrae**  
CBC Winnipeg

**Mac McCorquodale**  
Keystone Agricultural Producers Inc.

**Dr. J.R. Ingalls**  
Department of Animal Science  
University of Manitoba

**Ray Snitynsky**  
Chairman  
Agricultural Committee  
Winnipeg Chamber of Commerce

**Albert van der Meulen**  
Regional Director  
Veterinary Inspection Directorate  
Agriculture Canada

### Saskatoon Meeting — May 18, 1988

**Fred Longstaff**  
General Manager  
Saskatchewan Turkey Grower's Marketing Board

**Jim Morris**  
General Manager  
Saskatchewan Pork Producers Marketing Board

**Garth Larson**  
Director  
Saskatchewan Pork Producers Marketing Board

**Richard Wright**  
Chairman  
Saskatchewan Pork Producers Marketing Board

**Rob Brown**  
Farm Director  
CJWW

**Jack Braidek**  
Western Producer

**Gary Moore**  
Assistant Manager  
Industrial Development Department  
City of Saskatoon

**John Cross**  
President  
Philom Bios

**Dr. Bill Yates**  
Director  
Health of Animals Laboratory  
Agriculture Canada

**Leo Bertoia**  
Director  
Saskatchewan Dairy Producer's Co-op

**Lynn Biggart**  
Director  
Canadian Cattlemen's Association

**Duane McCartney**  
Melfort Research Station  
Agriculture Canada

**Ross Harwood**  
Deloitte Haskins & Sells

**Laurel Stein**  
Deloitte Haskins & Sells

**Sean Quinn**  
McKercher, McKercher, Stack, Korchin & Laing

**Jim Roberts**  
Roberts & Poole Communications

**Dr. Robert Laing**  
President  
Saskatchewan Veterinary Medical Association

**John Patience**  
Director  
Prairie Swine Center

**Bill Kerr**  
Manager  
Goodale Farm  
University of Saskatchewan

**David Dombowsky**  
Chairman  
Biostar Inc.

**Mac Sheppard**  
Trustee  
VIDO Research Trust  
University of Saskatchewan

**Dr. Jack Manns**  
Associate Vice President (Research)  
and Dean of the College of  
Graduate Studies and Research  
University of Saskatchewan

**Dr. Bob Saunders**  
Head, Department of Veterinary Microbiology  
Western College of Veterinary Medicine

**Dr. Otto Radostits**  
Head, Department of Veterinary  
Internal Medicine  
Western College of Veterinary Medicine

**Honourable Lorne Hepworth**  
Minister of Education  
Government of Saskatchewan

**Dr. Al Theede**  
Saskatchewan Agriculture

**Dr. Ernie Barber**  
Department of Engineering  
University of Saskatchewan

**Dr. C.H. Bigland**  
Victoria, British Columbia  
(Past Director of VIDO)

**Ken Smith**  
Board of Trade  
Saskatoon

**Dalton Tamney**  
Manager Advanced Technology Agreement  
Department of Regional Industrial Expansion

**Bill Reid**  
Regional Executive Director  
Department of Regional Industrial Expansion

**Bill Strauss**  
Executive Assistant to the  
Honourable Ray Hnatyshyn

**Harley Olson**  
Director General, Agriculture Sector  
Western Economic Diversification Office

**Dr. Cec Doige**  
Associate Dean (Research)  
Western College of Veterinary Medicine

**Peter McNeil**  
Director Advanced Technology Agreement  
Saskatchewan Science & Technology

**Richard Letilly**  
Acting Deputy Minister  
Saskatchewan Science & Technology

**Dr. Jim Hutch**  
President  
Saskatchewan Research Council

**Dr. Doug Harold**  
Veterinary Inspection  
Agriculture Canada

**Dr. Louise Nelson**  
Industrial Liaison Officer  
National Research Council  
Plant Biotechnology Institute

### Calgary Meeting — September 27, 1988

**Dennis Laycraft**  
Manager  
Alberta Cattle Commission

**Gordon Mitchell**  
Assistant Manager  
Alberta Cattle Commission

**Steve Cullum**  
Chairman  
Alberta Turkey Growers Marketing Board

**Bill Hulsman**  
President  
Central Alberta Dairy Pool

**Jim David**  
Western Stock Growers Association

**Dr. Malcolm Gray**  
President  
Alberta Veterinary Medical Association

**Bernie Hummel**  
Executive Vice-President  
X.L. Foods

**Dr. Brian Tinker**  
Vice President  
University of Calgary  
(Past VIDO Board of Directors Member)

**Neil Harvie**  
Cochrane, Alberta

**John Stewart Smith**  
Cochrane, Alberta

**Dr. Ernie Pallister**  
Pallister Resource Management Limited  
(Past Member VIDO Board of Directors)

**Claire Koven**  
Pallister Resource Management Limited

**Dr. Michael Ward**  
Vice-President, Research  
University of Calgary

**Ben Thorlakson**  
President  
Thorlakson Feed Yards  
(Past Member VIDO Board of Directors)

**Garnet Altwasser**  
President  
Lakeside Farm Industries  
(Past Member VIDO Board of Directors)

**Ben McEwen**  
Deputy Minister  
Alberta Agriculture

**Harold Hanna**  
Assistant Deputy Manager  
Alberta Agriculture

**Dr. Terry Church**  
Head, Animal Health Division  
Alberta Agriculture

**Ron Weisenburger**  
Beef Cattle and Sheep Branch  
Alberta Agriculture

**Dr. Norm Lowes**  
Pathology Laboratory  
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**Mr. Rod Chernos**  
Poultry Specialist  
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**Dr. Len Anderson**  
Health of Animals  
Agriculture Canada

**Morley Hamilton**  
Alberta Technology, Research  
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**Chuck Greig**  
CHRB Radio  
High River

**Brian Batter**  
CFCW Radio  
Camrose

**Terry Hockaday**  
Manager, Information Services  
Fieldstone Marketing and Public Relations

**Hoss Hammer**  
CKGY Radio  
Red Deer

**Jerry Wade**  
CBRT TV  
Calgary

**Joy Zell**  
World of Beef Magazine

**Larry Thomas**  
Cattlemen Magazine

**Mr. Wayne Holt**  
President  
Alberta Feed Industry Association

**Derek Mather**  
President  
Vencap Equities Alberta Limited

**Mr. Peter Gooch**  
Manager, Agriculture Production Division  
Biotechnica Inc.

**Dr. Bill Costerton**  
University of Calgary

**Doug Morck**  
University of Calgary

**Norman A. Braksick**  
Executive Director  
North America Agriculture Marketing  
Upjohn Company

**Jim Smith**  
Chairman Research Committee  
Alberta Pork Producers Marketing Board

**Dan McKinnon**  
Research Committee  
Alberta Cattle Commission

**John Gill**  
Research Committee  
Alberta Cattle Commission

**Doug Caldwell**  
Lethbridge Research Station  
Agriculture Canada

**Warren Brower**  
Research Committee  
Alberta Cattle Commission

**John Campbell**  
Research Committee  
Alberta Cattle Commission

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