

VETERINARY
INFECTIOUS
DISEASE
ORGANIZATION

VIDO

**ANNUAL
REPORT**

**April 1, 1976 —
March 31, 1977**

REPORT of the DIRECTOR



Dr. C. H. BIGLAND, Director

Obtained his D.V.M. from the Ontario Veterinary College in 1941; his D.V.P.H. from the University of Toronto, in 1946; and his M.Sc. from the University of Alberta in 1960. His work experience includes: 5 years of veterinary practice in Calgary; 2 years with Agriculture Canada; 13 years with the Alberta Veterinary Laboratory in Edmonton; 2 years with University of California in Davis; and 10 years as a Professor, and Head of the Department of Veterinary Microbiology, WCVM, Saskatoon. In 1975, he was appointed Director of VIDO.

General Comments

VIDO has made great strides in the past most important formative year. Many precedents have been weighed and established with the form and fabric of a viable organization more fully consolidated. Our major objectives have been refined; an efficient, hard-working staff is being assembled; research is well under way on three or four fronts; the VIDO laboratory building is almost half finished and we are well embarked upon, what promises to be, a successful fund-raising campaign.

Personnel

Recognizing that any organization is only as good as the people who work in it, the Governing Committee and Board of Advisors have recommended that, since neonatal diarrhea in calves and pigs is to be our first major target, the best research workers possible should be gathered to concentrate work on this area. In addition, capable business office personnel are essential to "keeping the wheels turning".

VIDO was fortunate to have the following scientists as research collaborators:

- Dr. Lorne A. Babiuk, and Dr. B. T. Rouse of the Department of Veterinary Microbiology, who collaborated with Dr. Acres on the development of a radioimmunoassay for rotaviruses, as well as contributed excellent ideas in virology research and in equipment purchases recommendations.
- Dr. Gil Ward, Department of Veterinary Microbiology who worked on two projects; (a) the experimental production of neonatal diarrhea in calves, and (b) a possible vaccine for the control of weanling diarrhea in pigs.
- Dr. George G. Khachatourians, Department of Microbiology, College of Medicine, who is working on an innovative vaccine against pathogenic *E. coli*.

During the next year we will be enlarging staff considerably. We are searching for a person to contact the livestock industries on behalf of VIDO, a post-doctoral biochemist to work with Dr. Worthington, a research microbiologist to collaborate on the microbiological and virological aspects of neonatal diarrhea, and a veterinary swine research scientist. More technical assistance and animal technologists will also be needed.

Over the past year our Board of Advisors has been very instrumental in helping us plan for the future. Besides Dr. W. Weir, Dr. H. Vance, Dr. N. O. Nielsen and Mr. A. E. Pallister, the following guests have contributed greatly to our organization by their attendance at Board of Advisors meetings. They include:

Senator H. W. Hays, Calgary, Alberta

Dr. Mervin Franklin, Acting Vice-President (Academic), University of New Brunswick, Fredericton, N.B.

Mr. J. Fish, Vice-President, Devonian Foundation, Calgary, Alberta

Mr. F. Lynch-Staunton, rancher, Lundbreck, Alberta

Mr. R. W. Shopland, Secretary-Manager, Alberta Sheep & Wool Commission, Edmonton, Alberta

Mr. Wayne Clews, representing the Saskatchewan Charolais Association, Pangman, Saskatchewan

Dr. A. B. Kidd, Head, Veterinary Branch, Government of British Columbia, Victoria, B.C.

Dr. Lorne Greenaway, Steveston Veterinary Hospital, Richmond, B.C.

Dr. J. V. W. Greenfield, Veterinary Laboratory, Abbotsford, B.C.

Research

Despite working out of temporary facilities and the assembly of new VIDO staff, research is well under way — even before we move into our new VIDO laboratory. In addition to the collaborative research mentioned

above, the "in-house" research has progressed in the areas of:

1. Management control of calf scours. With the generous cooperation of the Department of Animal Science, Dr. Acres has made arrangements to use the cow-calf herd at the Termeunde Ranch at Lanigan. This is risky and expensive research which VIDO is capable of undertaking for the good of the livestock industry.
2. A very sensitive test for rotavirus, one of the causes of infant diarrhea in cattle, swine, rabbits and human infants, has been developed by Drs. Babiuk, Rouse and Acres.
3. The study of the stable toxin of *E. coli* by Dr. Worthington has made excellent strides in the few months Dr. Worthington has been with us. A breakthrough in the isolation of the toxin has been made and will be reported in the scientific journals.

Plans are already underway for research next year including:

1. The continuation of the management control of calf scours at the Termeunde Farm.
2. Large-scale tests on a new *E. coli* vaccine developed by Dr. Khachatourians. This work will be done by Dr. Acres in collaboration with Dr. Khachatourians, at the Termeunde Farm.
3. Research on the *E. coli* toxin vaccine will progress, and
4. Studies will be done on bovine mycoplasma in beef and dairy herds. In the latter instance, research will concentrate on mastitis.

Financial Picture

With the \$4.25 million expenditure for the VIDO Laboratory, operating costs for two years, and the start of an ambitious research program; the original funding will be exhausted by the end of the 1977-78 budget year. This has necessitated a major fund-raising program with the target of raising \$7.5 million for the next five years. With the active assistance of the Board of Advisors and the Governing Committee, a ten-year research program has been formulated (see insert); a \$7.5 million budget for the next five years has been carefully planned; and, briefs to governments are in preparation.

Since VIDO will be benefiting all of the people in Canada, our aim is to obtain \$2.5 million over five years from the Government of Canada, \$2.5 million from the Provincial Governments, and \$2.5 million from foundations, contract research grants, livestock association check-offs, donations and bequests from private individuals.

Plans are to contact the Federal Government, and the governments of British Columbia, Alberta, Saskatchewan, Manitoba, and Ontario in preparation for discussion of VIDO financing at the Federal-Provincial Ministers and Deputy Ministers of Agriculture Conference to be held in July 1977.

To help develop government contacts, Mr. A. C. Rankin of Capital Consulting Ltd., has been working with VIDO on an advisory basis. He has also been involved in reviewing our grant applications.

We have had excellent encouraging support from all of the facets of the livestock industry we have contacted. They support the work of VIDO in principle, and some associations are considering special allocations of check-off funds to be earmarked for VIDO research.

Our audited financial statements are enclosed which I think indicate that all expenditures have been made to the advantage of the livestock industry.

It should be recognized that if VIDO was not located on the University of Saskatchewan campus, it could not avail itself of the many services functioning on the campus; its expenses would be markedly higher than those shown on our financial report. They would include such major expenditures as taxes, employment of a larger office staff, employment of professional building engineers for construction and supervision, salary of the Director, and many other costly services. No specific figure can be put



Mr. A. E. PALLISTER, Chairman
Board of Advisors

on the value of this "in-kind" contribution, however, it could be close to \$100,000 for the year. This, in addition to our budget expenditure of approximately \$195,000 gives a cost of total activity for VIDO of almost \$300,000 for the year 1976-77.

Future Endeavours

1) The enclosed *Ten Year Research Plan* frames out the broad research activities expected for VIDO. It is based on the units of effort for the various disease syndromes on which research will be concentrated. The bulk of our effort for the first three to five years is on neonatal diarrhea of calves and pigs, weanling diarrhea, and later, other intestinal conditions. In addition, we will be devoting lesser amounts of effort on other disease conditions (which may develop into major thrusts in future years). We recognize that it is important to respond to the needs of the industry, and the next major disease obstacle to livestock production may be the pneumonia complex. This is a major undertaking, due to the diversity of causative agents and management factors involved. They are even greater than those for neonatal diarrhea.

2) Expanding our contacts with the livestock and poultry industries is of major importance. This is in order to: inform the producers that VIDO is working on their behalf; hear their ideas on the research that is needed; solicit their support in principle, and if they are so inclined, to contribute financially to the operation of VIDO. By so doing, they would have a member on the Board of Advisors to guide our future research. We hope to publish newsletters and surveys, and speak directly to various livestock and poultry associations. In order to do this properly, a person who is conversant with VIDO's aims and with the livestock industries will be appointed in the near future. He will be one of VIDO's major contacts with the whole livestock and poultry industry in Canada.

In addition, the public relations firm of Parry/Lumby are preparing a ten minute slide-tape presentation and an illustrated brochure on VIDO.

3) Our fund-raising endeavours will continue until the \$7.5 million target has been reached.

Problems

1) Our major problem is putting into place the \$7.5 million needed to finance VIDO for the next five years. This we recognize is at a time of inflation and increased costs of equipment, materials and supplies.

2) Our next major problem is the hiring of the best people available to concentrate their expertise on VIDO's research problems. We have been successful so far in having on our team some excellent workers who I am sure will build a reputation for VIDO which will attract other prominent scientists.

Concluding Statement

The whole VIDO team has been working extremely hard to make VIDO an active, vibrant force to serve the livestock industry through the control of common infectious diseases of food-producing animals. Much progress has been made and we are off to a good start for expanded service in the future.



Dr. C. H. Bigland
Director.

REPORT of the GOVERNING COMMITTEE



Dean N. O. NIELSON, Chairman

The Governing Committee of VIDO met August 19, 1976, November 19, 1976 and March 8, 1977. As the group responsible for management affairs, the Committee reviewed, approved, or recommended as appropriate, in matters pertaining to the capital program, budgets, personnel policies, and the research program.

Of particular concern to the Governing Committee in the past year, has been the establishment of a smooth working relationship between VIDO and the University. The goal of the Committee has been to assist VIDO in avoiding unnecessary institutional constraints to creative research while at the same time allowing the utilization of the many services the University has to offer. These include those related to personnel administration, budget control and accounting, audit services, printing services, and supervision of capital construction.

The Committee was gratified at the remarkable progress being made in experiments on calf diarrhea at the Termeunde experimental farm. This project was feasible because of the availability of University facilities and a wide variety of scientific expertise. It is a graphic illustration of the potential of VIDO to mobilize unique resources available at the University of Saskatchewan to work on the primary disease problems of the livestock industry in Canada.

The Committee considers VIDO's research objective as an important element in the quest for more satisfactory preventive medicine programs. The widespread introduction of preventive medicine into livestock production is a major task for veterinary medicine in the decade which lies ahead.

The Governing Committee has kept itself informed on various fund raising activities at the University in order to assure that VIDO's approach to the livestock industry and governments for funds is properly coordinated.



VIDO Building under construction — March 1977.

VIDO STAFF

March 1977



STEPHEN D. ACRES
Research Scientist

Was born in Penticton, B.C., and received his elementary and high school education at Grand Forks, B.C. After spending three years at the University of British Columbia, Dr. Acres entered the Western College of Veterinary Medicine and subsequently obtained his Doctor of Veterinary Medicine degree, with great distinction, in 1970. In 1975, he earned the degree of Master of Preventive Veterinary Medicine from the University of California at Davis. He joined VIDO as a Professional Research Associate in July, 1976. He has just completed his PhD thesis in the area of neonatal diarrhea research and is rapidly becoming a North American authority in this area. He has been in charge of the first two major research projects undertaken by VIDO.



MARSHA R. PERMUT,
Business Manager

Began work as Business Manager of VIDO in August, 1976. She obtained her B.Sc. in Microbiology in 1970 from the University of Manitoba and then worked in research as a technician in biology, chemistry, epidemiology, and virology labs. She was in charge of a research lab facility prior to undertaking her MBA degree. Her job entails assisting the Director in VIDO's various business activities.



ROBERT W. WORTHINGTON
Visiting Scientist

Arrived from the University of Pretoria, South Africa, in November, 1976 as VIDO's first Visiting Scientist. He is an expert in the biochemistry of bacterial toxins and has been working with VIDO on *E. coli* stable and labile toxins. His project has been to attempt to isolate and purify these toxins in the hopes of producing a vaccine.



PHYLLIS ZOERB
Secretary

Completed her high school training at Delisle Composite High in 1975. She graduated from Robertson Secretarial School in June, 1976, near the top of her class. She started work with VIDO as a full-time secretary in July, 1976. Phyllis' talents are many and her enthusiasm and efficiency are much appreciated.



VERONICA BACHYNSKY
Bookkeeper

Roni was born in Winnipeg, Manitoba and lived for several years in Saskatchewan when raising her family. She moved to St. Johns, Nfld., where she obtained her Basic Accounting Diploma (1972) and worked for Memorial University as a Senior Accounting Clerk before moving to Saskatoon. We are pleased to have her on our staff keeping our books in line.



MOLLY L. DENSON
Researcher

Obtained her B.A. at McGill University, and her M.Sc. in Medical Mycology at McGill University. She previously worked in the Department of Bacteriology at McGill, and the Department of Botany at the University of Saskatchewan. Since 1973 she has concentrated on Mycoplasma technology under an MRC grant as a half-time technologist.



BRIAN S. FREEZE
Researcher

Attended the University of Alberta in Edmonton and the University of Lethbridge. He completed an Honours BSA in Animal Science at the University of Saskatchewan, 1975. He started with VIDO in 1975 as a Graduate Student in Agricultural Economics.



SUE ADOLF
Secretary

Completed her high school training with Evan Hardy Collegiate, Saskatoon. She graduated from Robertson Secretarial School in 1970, and was employed by the Department of Veterinary Microbiology, WCVM. She accepted a position as a half-time secretary with VIDO in 1975.

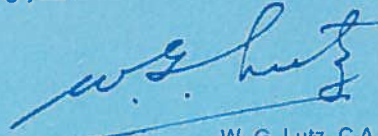
Financial Statements

March 31, 1977

AUDITOR'S REPORT

I have examined the Capital Fund and Operating Fund statements of income, expenditure and balance of unexpended funds for the Veterinary Infectious Disease Organization for the year ended March 31, 1977. My examination included a general review of accounting procedures and such tests of the accounting records and other supporting evidence as I considered necessary in the circumstances.

In my opinion, these financial statements present fairly the results of operations of the Veterinary Infectious Disease Organization for the year ended March 31, 1977 and unexpended funds on hand at that date, in accordance with generally accepted accounting principles applied on a basis consistent with that of the preceding year.



W. G. Lutz, C.A.,
Provincial Auditor.

Regina, Saskatchewan,
May 12, 1977.

NOTES TO FINANCIAL STATEMENTS March 31, 1977

- The estimated total project cost for VIDO building including furniture and fixtures, required sites and improvements is \$4,270,000. A contract in the amount of \$3,167,274 has been signed with the building contractors and to March 31, 1977 progress payments of \$763,275 have been made.
- At March 31, 1977, VIDO had commitments of \$17,372.25 in the operating fund.
- The research grants as presented in the Schedule are held by the University of Saskatchewan and are administered by VIDO on behalf of the grantee Dr. Chris Bigland.
- The 1976 comparative figures are presented in the Schedule were not disclosed in 1976.

CAPITAL FUND — STATEMENT OF INCOME, EXPENDITURE and BALANCE OF UNEXPENDED FUNDS Year Ended March 31, 1977

	Year Ended March 31, 1977	Cumulative Total To Date
Revenue:		
Grants Received — Province of Alberta	\$ —	\$1,870,000.00
Other Income — Interest	<u>162,495.08</u>	<u>250,295.37</u>
	<u>162,495.08</u>	<u>2,120,295.37</u>
Expenditure:		
Sites and Improvements	7,846.72	10,958.35
Furnishings and Fixtures	14,878.34	25,018.39
Buildings	<u>1,017,009.11</u>	<u>1,141,487.20</u>
	<u>1,039,734.17</u>	<u>1,177,463.94</u>
Excess of Revenue over Expenditure	(877,239.09)	942,831.43
Unexpended funds, beginning of year	<u>1,820,070.52</u>	—
Unexpended funds, end of year	<u>\$ 942,831.43</u>	<u>\$ 942,831.43</u>

See notes above.

**OPERATING FUND — STATEMENT OF INCOME, EXPENDITURE
and
BALANCE OF UNEXPENDED FUNDS
Year Ended March 31, 1977**

	1977	1976
Revenue:		
Grants Received — Province of Saskatchewan	\$200,000.00	\$200,000.00
Other Income — Interest	22,926.71	6,746.68
Research Projects	<u>10,679.00</u>	<u>11,618.00</u>
	<u>233,605.71</u>	<u>218,364.68</u>
Expenditure:		
Salaries	66,767.31	11,603.16
Fringe Benefits — Pension	\$1,396.78	
— Other	<u>1,903.41</u>	229.33
Material and Supply	32,991.99	5,179.46
Travel	13,354.03	1,917.88
Equipment	41,979.43	10,538.48
Miscellaneous	8,129.42	455.70
Research Projects	<u>9,298.88</u>	<u>14,477.27</u>
	<u>175,821.25</u>	<u>44,401.28</u>
Excess of Revenue over Expenditure	57,784.46	173,963.40
Unexpended Funds, beginning of year	<u>177,419.85</u>	<u>3,456.45</u>
Unexpended funds, end of year	<u>\$235,204.31</u>	<u>\$177,419.85</u>

**RESEARCH PROJECTS
SCHEDULE OF INCOME, EXPENDITURE
and
BALANCE OF UNEXPENDED FUNDS
Year Ended March 31, 1977**

	National Research Council Grant No. A6958	Alberta Agricultural Research Trust Project No. 55-28103	TOTAL	
			1977	1976
Revenue:				
Grants Received	<u>\$8,775.00</u>	<u>\$1,904.00</u>	<u>\$10,679.00</u>	<u>\$11,618.00</u>
Expenditure:				
Salaries	7,508.36	77.93	7,586.29	7,871.74
Fringe Benefits	323.36	1.84	325.20	161.77
Equipment, Materials, and Supplies	319.15	738.58	1,057.73	4,733.03
Travel	310.00	—	310.00	975.02
Computer Services	<u>19.66</u>	—	<u>19.66</u>	<u>735.71</u>
	<u>8,480.53</u>	<u>818.35</u>	<u>9,298.88</u>	<u>14,477.27</u>
Excess of Revenue over Expenditure	294.47	1,085.65	1,380.12	(2,859.27)
Unexpended Funds, beginning of year	<u>371.10</u>	<u>226.08</u>	<u>597.18</u>	<u>3,456.45</u>
Unexpended Funds, end of year	<u>\$ 665.57</u>	<u>\$1,311.73</u>	<u>\$ 1,977.30</u>	<u>\$ 597.18</u>

See notes on previous page.

VIDO CONSTRUCTION GETS UNDERWAY



Chris Bigland takes his turn at the plough. Ground-breaking ceremony August 1976.



Hay ride around VIDO site on "ground breaking day". Left to right: Sask. Minister of Agric. Hon. Edgar E. Kaeding; (unknown little friend); Dr. C. H. Bigland; Ms. Cathy Andres of Western Development Museum, Saskatoon; Mr. Ed Mensch, owner of oxen team from Shellmouth, Man.

On August 12, 1976, the ground at the site of VIDO was officially broken by a team of oxen named Mike Pearson and John Diefenbaker. These are owned by Mr. Ed Mensch of Shellmouth, Manitoba and were brought to Saskatoon and hosted by Frank Andres, Edwin Andres and Arthur Schmid of MacNutt, Saskatchewan. Taking turns at handling the walking plough were the Honorable Edgar Kaeding, Minister of Agriculture for the Province of Saskatchewan, representing both himself and the Honorable Marvin Moore, Minister of Agriculture for the Province of Alberta; President R. W. Begg, representing the University of Saskatchewan; Dr. W. Weir, Director of Veterinary Services for the Province of Saskatchewan representing the Board of Advisors of VIDO; and Dean N. O. Nielsen of the Western College of Veterinary Medicine, representing the Governing Committee of VIDO.

In September, the tenders for the VIDO building were opened. The lowest bid was \$4.7 million. In order to cut back to the allowable \$4.25 million reductions included: the cattle isolation outbuilding and the swine isolation outbuilding, together with one-third of the equipment budget. The contract was let to CANA Construction in September with a scheduled completion date of February, 1978. Excellent progress has been made on the building, due to good building weather throughout the winter and no labor stoppage. The architects of Arnott, McPhail, and Johnstone are capably represented by Mr. Ross Johnstone, with consultants Jim McCarten (Mechanical) and Lorne Rittenburg (Electrical).

The entire Buildings and Grounds staff have been actively involved with VIDO but special mention could be made of Messrs. Gordon D. Smith, our Planning Engineer, Terry I. Hellquist, the Project Engineer overseeing the present work, P. Syl Skarsgard, Alan D. Reed, Robert B. Hall, Ian Innes, Paul E. Juneau, Jack E. Wickstrom, Joe W. Dewyn, Emil T. Huszar and others who have been working hard for the successful completion of the VIDO building.

The new VIDO Laboratory should be ready for occupancy by March, 1978. We are already preparing to move into the new building, purchasing equipment, looking for new personnel, investigating animal care and the utilization of the isolation units. A great deal of work must be done before we are settled into the new facilities. In conjunction with this will be the moving of our satellite laboratory to a desirable location in Alberta to further extend our activities in that province.

The first VIDO Minisymposium on Neonatal Diarrhea in Calves and Pigs was held in May 1976. Although organized in a short time with the prime purpose of informing and advising VIDO on research in neonatal diarrhea; excellent speakers were obtained from several countries, representing the foremost areas of research in neonatal diarrhea. An excellent interchange of ideas took place between the research workers. Their advice to VIDO, launched our present research in this area i.e. the management control of neonatal diarrhea and sensitive diagnostic techniques to differentiate one causative agent from another. The Proceedings of this symposium has been published, with the financial assistance of the Saskatchewan Wheat Pool, the United Grain Growers Ltd., and United Feeds Ltd. It has been widely distributed to research workers in the area of neonatal diarrhea. The demand has been so great that a second printing is planned.

A second international symposium on neonatal diarrhea will be hosted by VIDO in October 1978. Already we have acceptance from two of the leaders in research; Dr. H. Williams-Smith of Houghton, England, and Dr. Harley Moon of the National Animal Disease Laboratory in Ames, Iowa. They will be our keynote speakers. Presentations are being invited for the symposium. All being well, we plan on having the official opening of the VIDO Laboratory at the same time as the symposium.

When knowledgeable personnel are invited to VIDO for advice or interviews, we try to hold public seminars so that others on campus might benefit from the knowledge of these visitors. Two such seminars were held this past year. Conversely, our staff have attended 10 educational conferences and have made scientific presentations at 3 meetings.

The details of research on *Mycoplasma meleagridis* are being "tidied up" for publication. Over the last several months our emphasis has shifted from studying mycoplasma in turkeys to studying this agent in cattle and swine. To assist in this transition, Mrs. Molly Denson has taken a special three-day training session at the ADRI (W) in Lethbridge under the expert tutelage of Dr. Ed Langford. We are planning joint projects with several investigators from the Clinics of the WCVM, especially on work in bovine mycoplasmas causing mastitis, pneumonia and arthritis.

One of the main causes of diarrhea in calves and other animals is an organism called *Escherichia coli*. Many different strains of *E. coli* occur in nature, but most of these are harmless, normal inhabitants of animal guts. Small pieces of genetic material called plasmids can be transmitted from one strain of *E. coli* to another. One type of plasmid transmits the genetic information which instructs any bacterium infected with such a plasmid to produce intestinal poisons called enterotoxins, which cause diarrhea in the host animal. Organisms which contain these plasmids are called enterotoxigenic *E. coli* (EEC).

EEC may produce a heat stable toxin (ST), a heat labile toxin (LT), or both types of toxin. We have chosen to work initially on the ST toxin because it is the type of toxin produced by the vast majority of strains of *E. coli* causing diarrhea in calves.

Less is known about ST than LT toxins, and a considerable amount of basic research will have to be undertaken before we can apply this knowledge to the more practical aspects of scours control. Our primary aims are to find methods of isolating and purifying the toxin and to develop a vaccine from it which can then be used to induce an immune response to the effects of the toxin in animals. This sort of research would eliminate the necessity of producing a multitude of separate vaccines against the large number of the EEC strains found in animals.

Since the beginning of this project (over 4 months ago), Dr. Worthington has made considerable progress in the purification of the toxin, and we now believe that we are able to separate a number of fractions of ST-

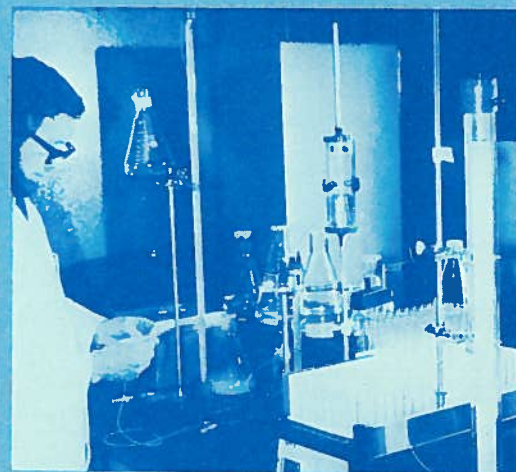
SYMPOSIA and SEMINARS



Speakers at the VIDO minisymposium were (front row, left to right): Dr. J. A. Bradley, Dr. G. W. Forsyth, Dr. H. W. Moon, Dr. G. G. Khachatourians, Mr. B. Freeze, Dr. C. H. Bigland. (Back row, left to right): Dr. S. D. Acres, Dr. D. L. Hamilton, Dr. M. Morin, Dr. L. L. Myers, Dr. J. Svendsen, Dr. C. L. Gyles, Dr. C. A. Mebus, Dr. O. M. Radostits, and Dr. M. R. Wilson.

Mycoplasma Research

E. coli Enterotoxin Project



Dr. R. W. Worthington, visiting scientist, working on *E. coli* stable toxin.

Diagnostic Radioimmunoassay (RIA) Project



1. Control panel for the gamma counter.
2. Sample changer of the gamma counter.

Termeunde Farm Project — Management Prevention Of Neonatal Diarrhea In Calves

containing material in highly purified form. One of the major problems in this type of isolation is that ST toxin is a small molecule and does not induce an immune response in an animal into which it is injected. Consequently, the next step in our research will be to try to alter the toxin chemically so that it will elicit an immune response in the vaccinated animal.

A microradio-immune assay for rotavirus antibody has been developed by Drs. L. A. Babiuk and B. T. Rouse, from the WCVM, in collaboration with Dr. Acres of VIDO. The technique is rapid, inexpensive, and appears to be 10 to 100 times more sensitive than previously used methods.

The technique is now being used to study the epidemiology of bovine rotavirus. A preliminary survey conducted by Dr. Babiuk of the prevalence of rotavirus antibody within the cattle population of Saskatchewan revealed that 237 out of 300 (79%) cows in 29 out of 30 (97%) herds had titers (antibody levels) to rotavirus.

Dr. Acres will be using the technique to study antibody levels in calves born under different management systems at the Termeunde Farm.

Studies are also being done to determine if there are differences in the levels of rotavirus antibody found in the milk of cows nursing normal calves and those nursing calves infected with rotavirus.

During the summer the technique will be adapted to detect other enteropathogens.

The scientists have written a paper on this technique and it will be published in the June issue of the *Journal of Clinical Microbiology*. Dr. Babiuk will present this work to the International Symposium on the Reoviridae in Guelph (May, 1977), while Dr. Acres will present this technique to the Canadian Federation of Biological Sciences Meeting in Calgary in June.

This year's major objectives are to determine if population density and confinement of cows and calves in the maternity area affect: 1) the occurrence and severity of calf scours and, 2) the potential for the occurrence of outbreaks of calf scours.

This project, which will be on-going for three to five years will be conducted by Dr. Acres at the University of Saskatchewan farm at Lanigan, Saskatchewan. We will be working with 200 Hereford cows loaned to VIDO by the Department of Animal Science.

The 200 pregnant cows were wintered together and have since then been divided into four groups of 50 cows each. Groups A and D were housed in pens allowing 250 square feet per cow, while Groups B and C were housed in pens allowing 1,000 square feet per cow. Cows and calves in Groups A and B will be turned out into 8 acre pastures immediately after calving. On the other hand, cows and calves in Groups C and D will be confined in the calving pens for 10 days following calving, before being turned out into 8 acre pastures (see diagram of pens).

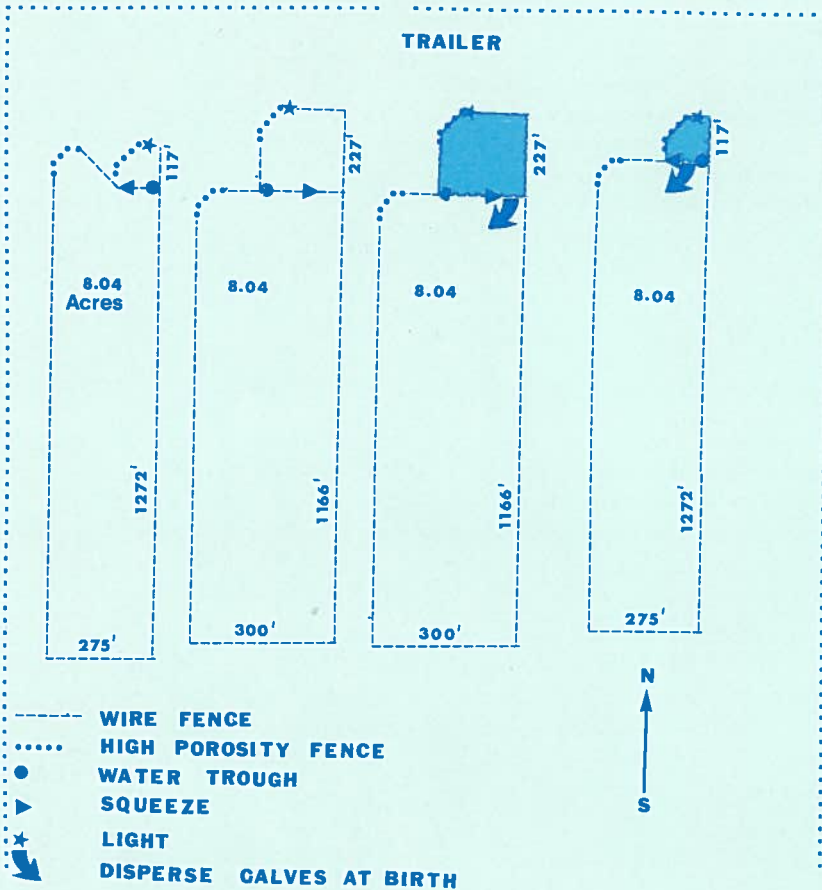
Cows and calves will be studied until early June when they will finally be turned out to pasture. Throughout the calving period samples will be collected from the calving pens (the cows and the calves). These samples will be processed during the summer and fall of 1977 to determine which infectious agents were present in the animals, and the degree of immunity which the animals possessed. Weather data will also be collected and this

information will be correlated with the occurrence of scours.

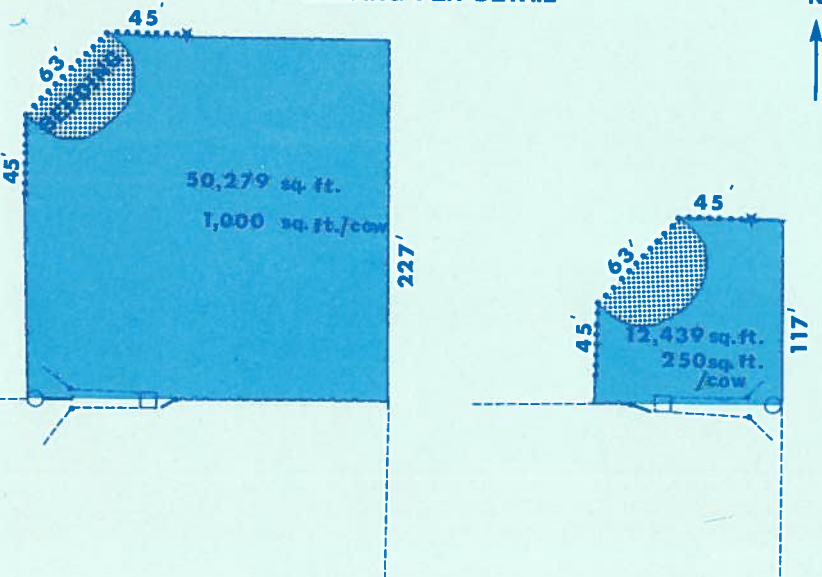
Although this research is very time-consuming and very costly, it is, we feel, of major significance in developing controls or preventive measures against scours.

To date, all the fencing has been put up on the farm, a new house trailer has been installed for the researchers, and all is ready for the ensuing calving season to begin, at a cost to VIDO of about \$70,000.

DIAGRAM OF CALVING PENS AND PASTURE AREAS



CALVING PEN DETAIL



Economics Of Animal Diseases

At VIDO's last Board meeting, Mr. Brian Freeze, our Agricultural Economist, conducted a discussion of the lack of statistics in Canada on the cost of various livestock diseases and on those most beneficial to control. He pointed out that although much information is available from various sources, no one group has attempted to put the information together so that a true picture of the disease costs emerge in Canada. He suggested that what Canada needs is a complete animal disease surveillance system similar to a model which was developed about three years ago in the United States, but which to date has not been implemented. The entire surveillance program would be too costly for VIDO to conduct on a Canada-wide basis but it was suggested that VIDO might conduct a pilot project, possibly with the aid of grant funds.

Such on-going economic studies at VIDO would provide cost-benefit ratios of disease control programs and would indicate which diseases are most costly to the industry, and as such, should be VIDO's next target. This information is needed by governments and producers to determine the necessity/effectiveness of future preventive medicine, herd health, or vetericare programs.

We will also conduct cost-benefit analyses on vaccines, drugs, or management practices recommended by VIDO's scientists, to ensure that maximum returns are realized from disease control.

E. coli "Live" K99 Vaccine Project

Most vaccines against diseases caused by bacteria are made from killed organisms or their components. Dr. Khachatourians' project is unique in that he is attempting to prepare a "living" vaccine, but one in which the organisms do not reproduce or cause disease.

This work has been in progress for approximately six months, during which Dr. Khachatourians has prepared the vaccine, tested it in rabbits, and proven it to be capable of producing specific antibodies.

In addition, Dr. Khachatourians has been able to attach one of the factors from *E. coli* involved in pathogenicity to his new vaccine. It is now ready for testing in large animals.

Dr. Acres and Dr. Khachatourians have planned two experiments to be conducted during the summer and next spring on cattle, to assess the new vaccine.

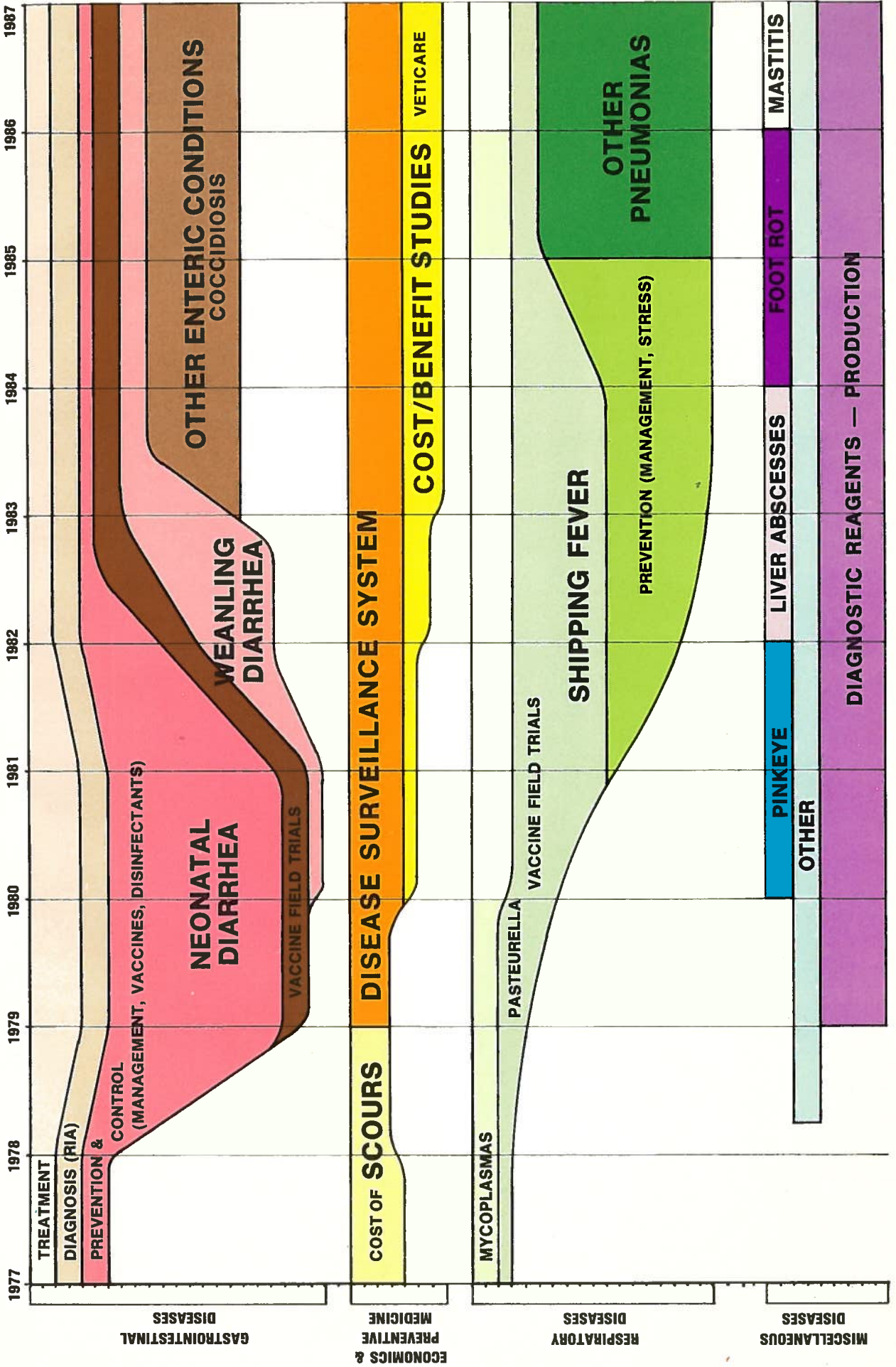


VIDO Lab in the Federal Animal Pathology Building.

VIDO RESEARCH PLAN

SCALE: 2.5 MM = 1 MAN-YEAR

CATTLE, SWINE, POULTRY, SHEEP, RABBITS, FISH AND OTHER FOOD PRODUCING ANIMALS

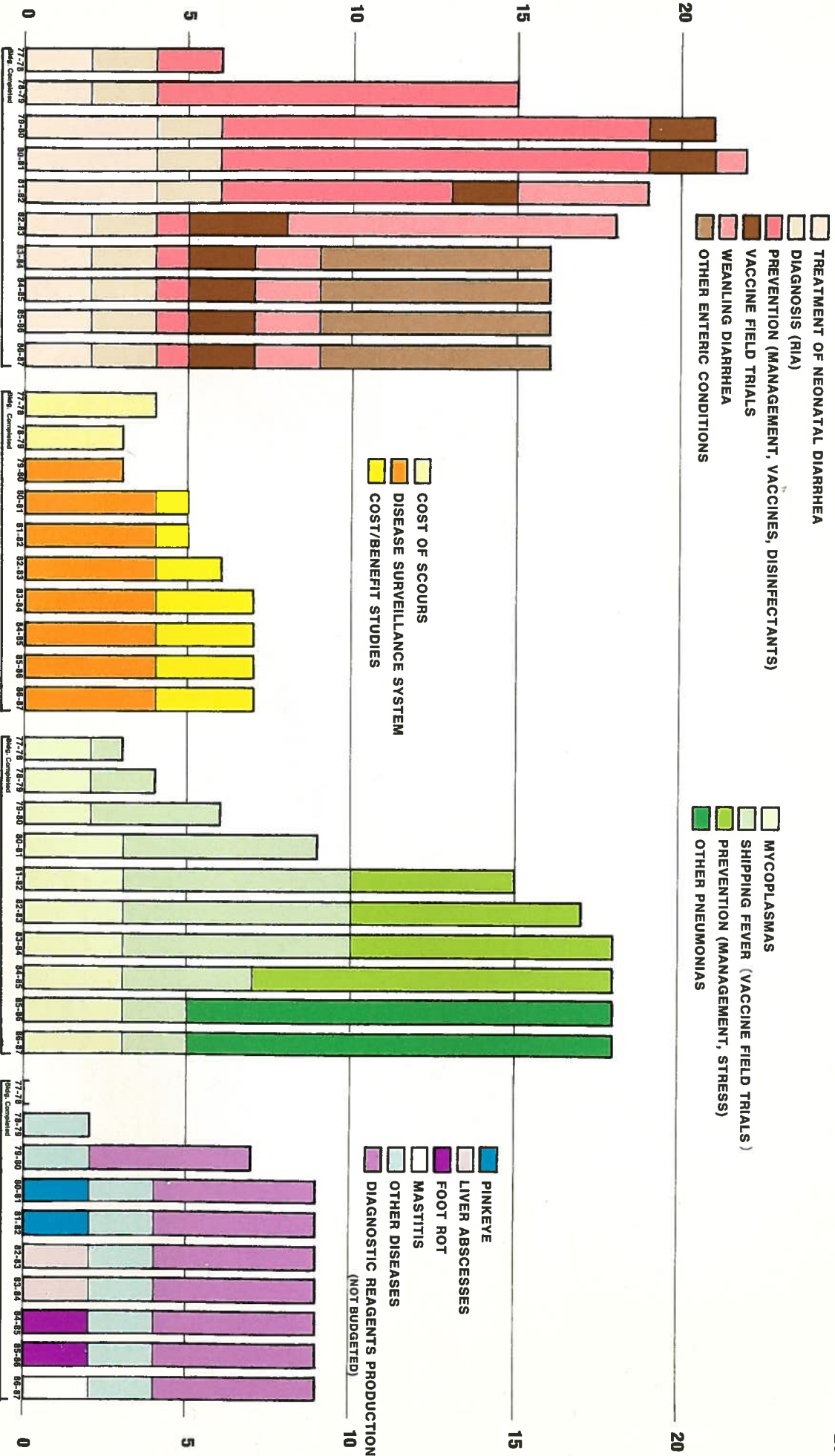


VIDO RESEARCH PLAN

CATTLE, SWINE, POULTRY, SHEEP, RABBITS, FISH AND OTHER FOOD PRODUCING ANIMALS

25

25



YEAR/CATEGORY

Historical Development

The Veterinary Infectious Disease Organization (VIDO) is devoted to serving the livestock industry through applied research on the control of common infectious diseases of food-producing animals. The idea of establishing such a research laboratory to act as a bridge between basic scientific discoveries and their use on the farm, has been in the minds of livestock men and veterinarians in Western Canada for many years. However, this concept started to develop only when the Devonian Group of Charitable Foundations of Calgary investigated VIDO through the Science Council of Canada and then decided to substantially fund it with \$2.2 million. It was quickly joined by the province of Saskatchewan, who offered \$1 million operating funds over a five-year period, and by the province of Alberta who gave a grant of \$1.87 million towards the cost of the laboratory building. The University of Saskatchewan agreed to provide the salary of the Director, 5 acres of land, maintenance of the building when complete, financial administration, and other ancillary services. The final agreement between the above parties establishing VIDO was signed in September 1975.

Major Objectives Of VIDO

1. Reduce the major economic loss to livestock owners from common infectious diseases and to improve the economic efficiency of livestock production.
2. Fill the gap between scientific discoveries in animal health research and their application on the farm.
3. Increase the world supply of animal protein by reducing wastage caused by common animal diseases.
4. Improve public health directly by reducing diseases which animals transmit to man, and indirectly by applying animal research findings to the diseases of man.
5. Reduce the suffering of animals caused by disease.
6. Study the economics of animal disease and animal health programs.

VIDO Board of Advisors

- Mr. A. E. Pallister — Chairman, Associate, Devonian Group of Charitable Foundations
- Dr. N. O. Nielsen — (ex officio) Dean, Western College of Veterinary Medicine
- Dr. H. N. Vance — Director of Veterinary Services, Alberta Government
- Dr. W. Weir — Director of Veterinary Services, Saskatchewan Government

VIDO Governing Committee

- Dr. N. O. Nielsen — Chairman, Dean, Western College of Veterinary Medicine
- Dr. R. W. Begg — President, University of Saskatchewan
- Dr. J. A. Brown — Dean, College of Agriculture
- Dr. K. J. McCallum — Dean, College of Graduate Studies and Research
- Dr. R. G. Murray — Dean, College of Medicine
- Mr. A. E. Pallister — (ex officio) Associate, Devonian Group of Charitable Foundations
- Mr. J. A. Pringle — Vice-President, (Administration), University of Saskatchewan
- Dr. B. Schnell — Dean, College of Pharmacy