



The Consultative Group on International Agricultural Research (CGIAR): The International Livestock Research Institute (ILRI)

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Introduction

Canadians are generally unaware of the Consultative Group on International Agricultural Research (CGIAR) and, more specifically, veterinarians are largely unfamiliar with the contributions to veterinary medicine made by the International Laboratory for Research on Animal Disease (ILRAD), which has now been incorporated into the International Livestock Research Institute (ILRI).

In this article, I describe the history and functions of the CGIAR, the accomplishments of the ILRAD, and the rationale for the formation of the ILRI.

The Consultative Group on International Agricultural Research

The CGIAR, which was formed in 1971, evolved from the Rockefeller Foundation-supported laboratories that led the "green revolution," namely, the International Rice Research Institute (IRRI) in the Philippines and the International Center for the Improvement of Maize and Wheat (Centro Internacional-de Mejoramiento de Maiz y Trigo, CIMMYT) in Mexico. Its fundamental goals are simple and noble; food security, alleviation of poverty, and protection of the environment. Subsequently, the establishment of new centers was guided largely by development needs for agricultural commodity-specific research, particular geographic considerations, and disciplinary need. Two animal-oriented centers were created in 1973–74, the ILRAD, in Nairobi, Kenya, and the International Livestock Centre for Africa (ILCA), in Addis Ababa, Ethiopia. Both ceased to exist when they were incorporated into the ILRI in 1995. Currently, there are 16 agricultural research organizations located around the world, supported by Canada and other donor nations.

The expansion of the CGIAR has been guided with the leadership of the World Bank, from whose executive ranks a chairman of the CGIAR is appointed. Currently, about 60 nations and development agencies are members of the CGIAR and contribute funds to operate the 16 centers. Its total budget, presently, is about 320 million US dollars. This represents approximately 4% of the funds expended world wide for agricultural research for developing countries. Because one of aims of the



Canadians with Nobel Laureate veterinarian, Dr. Peter Doherty, when he gave his inaugural Doherty lecture at the International Livestock Research Institute in Nairobi, April 1998 (from l to r): Drs. Bruce Wilkie, Helen Leitch, Patti Kristianson, Peter Doherty, and Ole Nielsen.

CGIAR is to strengthen the research capability of developing countries, all centers are actively engaged in graduate training in association with universities (involving about 50 000 scientists over the past 25 years).

Canada participates in the activities of the CGIAR via the International Development Centre (IDRC) and the Canadian International Development Agency (CIDA). Canada's total contribution to the CGIAR reached its peak in 1992 at 18.5 million US dollars, but, by 1997, it had declined somewhat to 15.5 million dollars. This was only 0.6% of Canada's total Overseas Development Assistance (ODA), which amounted to 2146 million US dollars in that year and represented about 0.36% of the GDP. By this measure, Canada ranks 7th among the most generous donor nations, behind Denmark, Norway, Netherlands, Sweden, Luxembourg, and France. The USA ranks 19th with 0.08% of its GDP going to ODA. Canada's contribution to ODA surely is an altruistic commitment in light of the federal deficit of the past many years.

Many Canadians have played a part in the CGIAR system. The ILRAD and, now, the ILRI are no exception. Dr. Kenneth Wells served on the Board of Trustees of ILRAD in its formative years and, as the result of an administrative crisis, was called on to serve as its director general for a period of time.

International Laboratory for Research on Animal Disease

At the time of its creation, the ILRAD undertook, as its primary task, the control of trypanosomiasis and

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theileriosis, diseases that continue to be major constraints to domestic animal production in Africa and elsewhere. The development of vaccines was given high priority at the inception of the ILRAD. It was soon recognized that this was a formidable task and that success would require a foundation of basic research. The ILRAD was one of the first veterinary research institutions to widely incorporate cutting edge molecular biology in its programs. As a consequence, the laboratories developed by the ILRAD in Nairobi are among the most modern anywhere and, likely, the most sophisticated on the African continent. Scientists at the ILRAD were an eclectic mix drawn from biological, medical, and veterinary establishments throughout the developed world; with the passage of time, indigenous scientists joined their ranks. The ILRAD developed a worldwide reputation among parasitologists and immunologists for its basic research. Among its most widely heralded achievements were the first cultivation of a trypanosome in vitro, the elucidation of the major cellular components and mechanisms of the bovine immune response to parasitic infections, the first production of monoclonal antibodies against protozoa, the first demonstration that cell-mediated immunity was responsible for protecting cattle against East Coast fever (theileriosis), the elucidation of the complex variable surface glycoprotein (VSG) coat of a trypanosome parasite and the first cloning of the VSG gene, the isolation of component antigens from *Theileria parva* for a vaccine against East Coast fever, the completion of the first restriction map of the genome of a protozoan parasite (*Theileria parva*), and basic work on genetic resistance to trypanosomiasis, including identification of 3 areas of the genome of laboratory animals that contribute to the control of trypanosomiasis, which represented the first mapping of quantitative trait loci controlling resistance to a hemoparasitic disease of major economic importance.

It is noteworthy that Dr. Peter Doherty, the first veterinarian to be a Nobel laureate, was a member of the Board of Trustees of the ILRAD from 1987–93, and served as chair of the Board's Program Committee, which oversaw the laboratory's research program.

Brief background to the creation of the International Livestock Research Institute

It is customary for the CGIAR to review in great detail, every 5 years, each of the centers under its aegis. The ILRAD and the ILCA came up for review in 1992. As a consequence, the eyes of the donors were drawn to these institutions and the role of livestock in development. The possibility of combining them emerged as an attractive possibility for several reasons; a belief that it would be more cost effective, that basic science at the ILRAD would be given a more direct link to the field, and that production systems science at the ILCA would become more strategic. Several studies concluded that linking the 2 institutions was desirable, but the vastly different cultures of the 2 institutions was seen as a serious, if not absolute, impediment.

General "donor fatigue" was eroding commitment of the donors to the CGIAR centres by the early 1990s. Discussions had begun on how to undertake substantial down-sizing across the CGIAR system. For example, in

the late 1980s, donors were providing the ILRAD with over 14 million US dollars annually, but, by 1993, this sum had fallen to less than 10 million and the trend was clearly a threat to the ILRAD's survival. The ILCA was experiencing similar erosion of donor support.

Also, at this time, it had become fashionable among environmental groups and some development agencies to bash livestock production because of associated environmental degradation and alleged threats to public health from consuming animal products. Critics pointed to events like the clearing of the rain forests in Brazil to make way for cattle ranching by wealthy land owners (an unnatural situation that was the result of ill-advised government policies). They had forgotten that income from animal products, like the "cream cheque" or the "egg money," had been vital to small farms in the development of agriculture in Canada and other developed nations. Now, similar opportunity was, and continues to be, vital for agricultural development in the third world. Used correctly, livestock, in fact, can aid in environmental protection, as well as contributing to good nutrition, food security, and farm income.

Recognizing the need to demonstrate the value of livestock in development and to counteract this negative and harmful perception of livestock, Winrock International, with the cooperation of the ILRAD and the ILCA, undertook a comprehensive study of livestock production in Africa in 1990–92, which included extensive consultation with African veterinarians and agronomists. To some of those working on the Winrock study, it was obvious that closer cooperation between the ILCA and the ILRAD was highly desirable, but it seemed unrealistic to believe that it would be possible to merge these 2 organizations by temperate means. The study concluded that livestock were indeed an essential element in agricultural development and in achieving the goals of the CGIAR. In retrospect, I believe this study marked a turning point to more favorable views of livestock among donors.

More generally, many leaders within agriculture saw the need for closer links between veterinary and animal science — look at what has happened to government animal health agencies in Canada. As greater attention was paid to the basic biological sciences and molecular biology, it was clear that both fields were moving into the same turf at the research level. To some of us familiar with epidemiology, which was now being applied to elucidate the determinants of animal productivity — a measure of health if you will — it was evident this discipline had much to offer that branch of animal science that dealt with animal management. Indeed, as many animal scientists answered the siren call of molecular biology, veterinarians have increasingly been seen as the experts in animal management, in substantial part because of their knowledge of epidemiology. Witness the success of herd health programs! The ILRAD had established a stronger presence in the field, largely manifest in its epidemiological research unit, and there were obvious desirable linkages with the ILCA's research program. Cooperative work on using genetically resistant animals to trypanosomiasis was already in place. It was widely apparent to donors that greater cooperation between the 2 centers was desirable.

Donors were becoming increasingly reluctant to fund basic research and were more inclined to support research

that could yield immediate benefits. To me, it seemed that they would rather take a small payoff from their investment than take the risks inherent in more basic but strategic research, where success could yield enormously greater benefit. After 20 years of research, the ILRAD had surely emerged as a strong presence in the world of science, but the practical fruits of its work, namely effective vaccines against theileriosis and trypanosomiasis, were still on the horizon and its impact on poor farmers was negligible.

It should not have been surprising that developing vaccines against hemoprotozoa was a formidable task. One only had to point to the enormous amounts of funding that had been expended on malarial research without success. It seemed that some, but certainly not all, donors believed this kind of basic research belonged in the laboratories of the developed nations and not in a CGIAR center. But it was also clear that if the ILRAD, and now the ILRI, gave up this research of vital importance to development, it was unlikely to be taken up by others. For example, industry could not be expected to pick up the task, in the absence of a lucrative market, which small holder farmers in Africa and elsewhere are not.

Meanwhile the ILCA, from its inception, had given high priority to field-based, production-related research. It had succeeded in characterizing the livestock production systems of the major agro-ecological zones of sub-Saharan Africa and had identified opportunities for interventions to make those systems more productive and sustainable. It had also developed technologies and management strategies that increased and sustained the productivity of animal agriculture. But donors were concerned that the research was too applied and not sufficiently strategic to have wide impact. The emphasis was on farming systems, but, unfortunately, the science of systems analysis was in its infancy and is only now emerging as a discipline to underpin field work. The ILCA's budget also was being seriously eroded.

In the early 1990s, donors were also discouraged at the very slow rate of progress of development on the African continent. At the same time, there was an increasing desire for more animal research relevant to development in Asia and Latin America that deserved higher priority. Since most of the CGIAR's investment in animal-related research was in Africa, this meant there was pressure to find a way to expand the ILRAD's and the ILCA's mandate to these other continents.

To its credit, the ILCA Board of Trustees came to the conclusion that it was strategically desirable for the animal centers to be proactive in developing an initiative that would unite the 2 centres into a single entity with a new wider mandate, if these centres were to optimize donor support for livestock research. The Board of the ILRAD eventually agreed with such action, even though the attitude of some members was captured by the assertion that supporting the establishment of the ILRI and the demise of the ILRAD was "like asking turkeys to vote for Christmas."

In summary, after several studies of livestock research in the CGIAR and the appointment of an implementation group, the ILRI became an operating reality on January 1, 1995.

The International Livestock Research Institute

It seems clear that the increases in food production that are necessary to overcome present undernutrition and human population increase will not be achieved by another green revolution based largely on more productive plant germplasm. This formidable task is made even more complex by the requirement to assure that agriculture preserves ecosystem health. These circumstances demand research that guides and enables much more sophisticated farm and agricultural production system management. The ILRI is evolving to meet this challenge, if not leading the way in all pertinent fields. It has expanded its programs to Asia and Latin America, and its core research programs, in biosciences and production systems, have been restructured to address more effectively the complexity of research on livestock-related development. The CGIAR's Technical Advisory Committee has been very supportive of the ILRI's research program and has encouraged donors to increase their funding for this center. The ILRI presently has an establishment of over 100 internationally recruited scientists and provides research opportunities for an additional 20 or so visiting scientists. It has a cadre of some 800 support staff, mostly at the former ILRAD campus in Nairobi, Kenya, which is the headquarters, and at the former ILCA campus in Addis Ababa, Ethiopia, who provide high-quality technical and administrative support to the research program. More detailed information can be obtained from its Web site: <http://www.cgiar.org/ilri>.

While it is too early to posit a final judgment, there has been remarkable progress in creating an institute that integrates applied and basic sciences on the one hand and social and natural sciences on the other, all the while focusing on achieving the noble goals of the CGIAR. This functional whole is a model that could well be emulated throughout the world in the application of science to agriculture and more generally to deal with research that impacts the environment.

Conclusion

My experience leads me to believe that the CGIAR research system is an effective organization for development-related research that continues to deserve the support of Canadian taxpayers. The ILRI is of particular interest to Canadian veterinarians, because its cutting-edge science in molecular biology and systems-related science add knowledge of use in Canada, as well as in the developing world. Furthermore, it is a superb venue for Canadian veterinarians to gain experience in tropical medicine and animal production.

At one of the early meetings of the group of individuals charged with creating the ILRI, Ismail Serageldin, chairman of the CGIAR, characterized the process as "a litmus test" for the ability of the CGIAR to adapt to changing circumstances. I believe the signs are positive.

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