

## NATIONAL SERVICES TO THE LIVESTOCK INDUSTRY

The Baurú meeting recommended that governments should carefully review the adequacy of their existing extension services, particularly those for the livestock producers, who often operate in more remote areas than the farmers, who specialize in the production of cash crops; they should make every effort to so strengthen these services that livestock producers may have ready access to help and guidance on all types of livestock, pasture and range management problems. To this end, FAO decided to ask member countries to participate in a comprehensive survey of all national organizations devoted to servicing and improving the livestock industry, the results of which would be discussed at the Buenos Aires meeting. Accordingly, a questionnaire was circulated among member countries to obtain information on physical facilities, personnel, financing, scope of the work in the case of ministries of agriculture, agricultural colleges, agricultural experimental stations and organizations of agricultural producers, distributors and processors of primary livestock products. The number of answers to this questionnaire received was insufficient to permit the drawing of over-all conclusions as to the adequacy of government services to the livestock industry, or to compile the information in a comparable way which could serve as guidance for future action. However, a considerable amount of useful information was assembled, which is summarized in this chapter together with supplemental information presented at the Buenos Aires meeting.

This survey is part of a broader one, which covers government services to all branches of agriculture. It was initiated by FAO three years ago, and was first discussed in the Americas during the Third FAO Regional Meeting on Agricultural Programs and Outlook in Latin America, held in Buenos Aires in September, 1954. Since the two surveys are closely interrelated, the conclusions drawn at the Regional Meeting from the results of the over-all survey, and the recommendations which followed them are of interest. These are likely to apply in the same measure to government services to the livestock industry. The Regional Meeting, having examined the needs of the farming populations of the countries of the Latin American region, and having noted with regret the fact that, in relation to the importance of agriculture in economic development and in proportion to the population engaged in agriculture, budgetary appropriations for agri-

cultural development are extremely low, recommended that governments consider the need to increase their budgetary allocations, and that government services to agriculture be strengthened in order to carry out efficiently the plans and programs for this section of the national economy.

There are major problems which are still to be overcome in relation to the improvement of national services. However, much progress has been achieved in recent years, particularly in the technical aspects of such services, also in the social, institutional and economic field. The number of agricultural schools, experiment stations, etc., has increased throughout the region, and a better staffing of such institutions has permitted an intensification of the programs they carry out. In many countries the ministries of agriculture have been reorganized to adapt themselves better to modern requirements, and budgetary allocations have been, on the whole, increased. On the institutional side, steps have been taken in many countries to increase the security of tenure of farmers, and to improve the possibilities of private ownership, improving, as a consequence, the investment conditions on the farms. Furthermore, many countries have established or improved their credit systems and given active support to co-operatives. On the economic side, marketing, with its related aspects, such as transport, storage, etc., has been the object of surveys and studies which have resulted in measures for its improvement.

Nevertheless, it must be recognized, as was done at the Regional Meeting, that in most instances this progress has only laid the basis for an over-all improvement, and that much remains to be done, also because progress has frequently been unbalanced and has lacked co-ordination. These latter are possibly among the basic problems, since, in order to achieve effective results, co-ordination and simultaneous development of all related aspects are essential. Increased production requires improved marketing facilities, including transportation; livestock research requires adequate extension services to make the practical application of its results possible, and extension in turn requires good agricultural schools to provide technicians of a satisfactory level of training.

In response to the questionnaire sent by FAO to all the governments of the region enquiring about expenditures on, and staffing of, government services to the livestock industry, several countries have submitted figures. These are shown in Tables 19 to 23, and give indications of the levels to which services to the livestock industry have been developed in the countries listed. Data on expenditures for various types of agricultural work are shown in Table 19, for eight countries or territories, and the numbers of trained workers employed in these same countries or territories in agricultural work are shown in Table 20. Data on training in

recent years are summarized in Tables 21, 22 and 23, since the degrees awarded and nature of the data submitted are such that they could not be summarized in a single table. Data on numbers of workers and students trained are for 1954, except in

TABLE 19 - EXPENDITURE ON GOVERNMENT SERVICES IN CERTAIN COUNTRIES

Country	Monetary Unit <sup>1</sup>	Annual Expenditure <sup>2</sup>			
		All agricultural work, excluding forestry	All animal production work, excluding veterinary and forage	All veterinary work	All pasture, range and fodder production work
Colombia	Pesos Colombianos	5 927 140	4 402 530	1 384 840	177 000
Ecuador	Sucres	9 265 000	—	1 602 000	—
Honduras, British	B.H. \$	480 000	33 000	11 600	22 000
Jamaica	£ sterling	1 884 100	59 853	18 340	10 841
Paraguay	Guaranies	13 380 000	4 055	921 685	—
Trinidad and Tobago	B.W.I. \$	1 221 354	182 905	69 410	86 770
U.S.A.	U.S. \$	213 300 678	10 756 141	25 625 388	25 905 987
Venezuela	Bolivares	115 697 124	26 360 589	20 058 595	1 500 000

<sup>1</sup> Exchange rates in terms of U. S.\$ in March 1954 were: \$ 1.00 = 2.50 Pesos Colombianos; 17.50 Sucres; 57 Guaranies; 0.3571 - £ sterling; 1.4285 \$ B. A.; 1 70 \$ B W. I.; and 3.35 Bolivares.

<sup>2</sup> For 1954, except Trinidad and Tobago, where figures are for 1953.

TABLE 20 - NUMBERS OF TECHNICAL EMPLOYEES IN CERTAIN COUNTRIES

Country	Number of Technically Trained Employees			
	All agricultural work	Animal husbandry, except veterinary and forage work	Veterinary work	Pasture, range and fodder work
Colombia	129	20	63	5
Ecuador	31	—	12	—
Honduras, British	13	1	1	1
Jamaica *	51	3	15	5
Paraguay	136	1	21	—
Trinidad and Tobago	212	30	7	20
U.S.A.	23 149	1 885	1 681	3 829
Venezuela	418	22	79	5

\* In addition to these officers with degrees, there are officers with diplomas as follows in Jamaica: 130 for all agricultural work, 32 for animal husbandry (except veterinary and forage) work, 9 for veterinary work and 3 for pasture, range and fodder work.

TABLE 21 – NUMBERS OF MEN TRAINED IN RECENT YEARS IN CERTAIN COUNTRIES

Country	Average Numbers of Men Trained Annually in Percent Years							
	"Peritos agrónomos"				"Ingenieros agrónomos"			
	All phases of agriculture	Animal husbandry except veterinary and forage work	Veterinary medicine	Pasture, range and fodder production	All phases of agriculture	Animal husbandry, except veterinary and forage work	Veterinary medicine	Pasture, range fodder production
Colombia	—	—	—	—	50	—	25	—
Ecuador	—	—	—	—	16	—	6	—
Honduras, British	—	—	—	—	—	—	—	—
Jamaica	24 <sup>1</sup>	—	—	—	— <sup>2</sup>	—	—	—
Paraguay	560	—	15	3	16	—	32	1
Trinidad and Tobago	25	—	—	—	20	—	—	—

<sup>1</sup> Diploma students from Farm School.

<sup>2</sup> None trained in Jamaica, but 6 to 10 are sent annually for study abroad.

TABLE 22 – DEGREES CONFERRED IN EDUCATIONAL INSTITUTIONS IN THE UNITED STATES OF AMERICA IN AGRICULTURAL AND RELATED SUBJECTS IN THE SCHOOL YEAR 1952/53

Subject	Degree		
	Bachelor's	Master's	Doctor's
Animal Husbandry	1 140	143	40
Other agricultural subjects, excluding forestry	6 659	1 200	409
Biological Sciences	9 707	1 807	966
Veterinary Medicine	878*	29	9
Home Economics	7 517	608	47
Physical Sciences	10 414	2 711	1 714
<b>Total</b>	<b>36 315</b>	<b>6 582</b>	<b>3 185</b>

\* D.V.M.

TABLE 23 – NUMBER OF TECHNICIANS GRADUATED IN 1950-1954 IN VENEZUELA

Year	"Ingenieros agrónomos"	Veterinarians	"Peritos agrónomos"
1950	13	10	29
1951	5	11	1
1952	4	3	18
1953	22	4	49
1954	13	13	58
<b>Total</b>	<b>57</b>	<b>41</b>	<b>155</b>

Trinidad and Tobago where they are for 1953, and in Ecuador where they constitute an average for the five recent years.

Advances in animal production and agriculture generally must be measured in terms of improved practices adopted by farmers and ranchers. By this standard of measurement it is apparent that much progress is possible. There is a fundamental need for speeding up the process of adoption of improved practices through a closer relationship among research workers, extension workers, educators and producers. This means that the research worker must know and study the problems being faced by the producer, the extensionist and the educator must be well acquainted with, and actively disseminate, the research knowledge to the new generations of students and especially to the farmers and ranchers. Clearly this can only be done when there is a close understanding and co-operation among these groups which so vitally influence agricultural development.

Information on recent developments in a number of countries, in addition to that tabulated in Tables 19 to 23, is summarized in the following paragraphs.

The Government in *Argentina* has taken action to improve livestock production under the second Five Year Plan. This includes all breeding, feeding and veterinary aspects of the livestock industry, and its object is to improve the quality of the herds through the utilization of high-bred animals; to increase livestock numbers by supporting the creation of new ranches, through a better utilization of the existing ranches, and finally to improve feeding through better pastures and a more intense and rational use of the land. This action is complemented by a national supervised credit system and by measures to improve the marketing of livestock products. Under the breeding aspects, in spite of the high level reached by Argentine livestock, it has been considered advisable to continue to import high quality animals of the different species. For this purpose, the Government allocated considerable amounts of foreign exchange for the import of animals from Canada, France, the Netherlands, Switzerland, the United Kingdom, and the United States of America. Thus, in 1954, more than 1,000 high-bred cattle were imported, among which were many first prize animals of cattle shows in the United Kingdom and other countries. In addition, substantial numbers of high-bred sheep and horses were imported.

The national plan for the improvement of livestock in *Argentina* gives high priority to the development of artificial insemination. For this purpose, two artificial insemination stations have been created which provide semen without charge to 43 sub-stations, which are formed by producers and supported by the state. Both the official and private stations receive technical advice and lab-

oratory facilities from the state. Parallel to this, special courses have been organized to train personnel in artificial insemination. So far, 598 certificates have been given. Through these measures, complemented by inspection of semen used on private establishments, artificial insemination is now widely accepted, particularly among breeders of dairy cattle.

Other measures for the improvement of livestock in Argentina include the organization or enlargement of regional breeding stations. About 30 such stations have been created in co-operation with provincial governments and breeders' associations. These stations are located in outlying areas, and are provided with pure-bred animals of different species by the Ministry of Agriculture. In addition, high-bred animals are given on loan to small livestock breeders, particularly in the outlying areas.

In regard to feeding, pastures of very high quality are abundant in the central zone of Argentina. However, in order to improve further the land use as well as the quality of the pastures, several experimental stations, such as those of Pergamino and Manfredi, carry out studies on the improvement of pastures and range management. In the outlying areas of the country, such as the extreme north and Patagonia, forage problems are more difficult. In these areas, the experimental stations of Canadon Leon (Santa Cruz) and Las Brenas (Chaco) are working on adaptation experiments of national and foreign species, as well as on range improvement. Furthermore, a new experimental station has recently been set up in the Province of La Pampa, with an area of 2,000 ha. which will work particularly on the improvement of cropping methods and on the improvement of the carrying capacity of pastures, as well as on disease resistance of fodder crops. In addition to the locally produced seed, a substantial amount of seed of foreign pastures is imported and multiplied in the country by private farmers under the inspection of the Government. The Government also purchases seeds and sells them under favorable conditions to farmers. The multiplication fields, at the same time, serve the purpose of demonstration farms.

As to the sanitary protection of livestock, the Argentine Ministry of Agriculture has at present 130 regional veterinarians who carry out direct campaigns against certain diseases and give advice to farmers. The important national campaigns include those against foot-and-mouth disease, scabies, ticks, brucellosis and trichinosis.

In the case of the first of these diseases, vaccination is now well established and livestock breeders have recognized the importance of this preventive measure. In addition, the State has carried out demonstration campaigns during which 92,416 cattle and 17,795 sheep were vaccinated, with very satisfactory results. During the period 1942-1952, ticks were eradicated from more

than 6 million ha., and in 1953/1954 the campaign became more intensive with another substantial area freed from this parasite. More than 3½ million sheep were treated for scabies during 1953/1954 over an area of about 10 million ha.

The sanitary measures in connection with brucellosis include control of the import and export of cattle, identification of brucellosis infestation areas, calfhood vaccination and, finally, control of dairy establishments. Of these latter 536 were inspected during the period 1949-1954, and more than 145,000 cows were vaccinated. Brucellosis is detected by use of the "ring test," which was applied to 2,739 dairy establishments on which 566,785 liters of milk were examined. All these campaigns, and particularly those against diseases common to man and animals, are complemented by intensive extension activities.

Supervised agricultural credit was originally established by the National Bank in Argentina, but has recently been extended to include all banks of the country. This credit system is based on the national ecological map, as well as on economic studies of the different agricultural areas of the country. This enables determination of the most advisable crops or types of agriculture, and systems of priority are established. In 1954, the National Bank allocated credits for agricultural purposes totaling 6,197 million pesos, compared to 5,974 million pesos in 1953. In addition, the proportion of agricultural credit in relation to credit for all purposes has continuously increased. Thus, in 1950, agricultural credit was 18.2 percent of the total credits allocated by the National Bank, rising to 36.4 percent in 1954. Further, the Central Bank includes in its yearly foreign exchange budget allocations for the import of elements required by agriculture and the livestock industry. These include mainly machinery, spares, certified seed, fertilizers, products for the fight against animal and plant pests and diseases, pedigree animals and semen. For these latter two items, yearly allocations amount to 30 million pesos and imports are regulated in accordance with a plan prepared yearly by the Ministry of Agriculture and Livestock.

There is also a policy in the field of colonization and land tenure which tends to give ample opportunity to farmers to become owners of the land they work either through the purchase of public lands or private land, considered unsuitable to fulfil a social function.

In *Bolivia*, there has been a long evolution of the social and economic aspects of agriculture since the Spanish colonization and it has had its consequences on the national economy. Particularly in the social aspects the evolution is reported to have been such as to prevent the full and economic utilization of the national resources, due to the prevalence of extremely large estates of more

than 10,000 ha. which concentrated more than 70 percent of the total cultivable area of the country, and on which agriculture and livestock breeding were carried out in a primitive way.

In consequence, the large Indian population had access to only a limited part of the arable area and was furthermore forced to work without adequate remuneration on the large estates. This situation has changed substantially since 1952 when several economic and social measures were enacted among which was land reform. The more important objectives of this land reform were to enable the indigenous population to become landowners, on the condition that they worked the whole area allocated to them, and to co-operate with them in the modernizing of their cropping methods. Wherever possible, the traditional collective system was retained, hoping thus to stimulate higher production and improved marketing. Other aspects of the reform aimed at facilitating investment of new capital, supporting the operation of co-operatives and providing technical help and credit. Measures have also been taken to stimulate internal migratory movements, in order to obtain better distribution of the population throughout the country. National services of benefit to the livestock industry include intensive action in the northeastern cattle area of the country, where foreign technicians have been engaged and substantial numbers of pure zebus introduced. Agricultural co-operatives for the rational exploitation and multiplication of sheep have also been established.

The Government of *Ecuador* is carrying out, through the Department of Livestock Breeding, several programs of livestock improvement. At the higher elevations of the country dairy cattle prevail and in this area purebred Holstein and Brown Swiss have been imported for crossing with native cattle. The low tropical areas specialize in cattle for meat production. Experimental crosses have been made with zebus which are then followed with crosses to Hereford, Shorthorn and Aberdeen Angus. Crosses with zebus have been satisfactory, but no definite results are so far available on the others. The Government has initiated a credit program in support of livestock production, for which a total of U.S. \$ 2,800,000 have been allocated for two years. These credits are given for terms of 5 years, and carry an interest of about 8 percent. Further action is related to advisory and extension services.

The recently created Livestock Research Institute in Guayaquil, will carry out research in diseases, artificial insemination, breeding, pastures, etc. The buildings and equipment of this institute were to be completed by the end of 1955. A similar institute exists already in Quito for the high areas. The Quito institute produces vaccines, which are sold at low prices, in disease control campaigns. Both institutes will carry out intensive studies on the livestock



development possibilities of the country, on which a national plan will be based in the near future.

In *El Salvador*, there has been established an Integral Demonstration Area by the Ministry of Agriculture and Livestock. This area covers approximately 38.6 square miles and is believed to be representative of the region where it is located. On it studies are carried out concerning the management of livestock, as practised in the area, and on the cost of livestock production.

Agricultural maps of El Salvador are also being compiled. So far, a land-use map showing the distribution of crops and pastures has been completed as well as several others concerning the location and size of dairy farms, their distance from consumption centers and the types of roads the milk has to pass over between the farm and where it is consumed. The Government is also making intensive efforts to open up the tropical coastal lowlands by constructing a bridge over the Rio Lempa and a coastal highway and by providing the area with electricity. In addition, attention is being paid to the legal and practical measures for the fight against animal diseases and pests. At present, all cattle entering the country are vaccinated unless accompanied by sanitary certificates, but no quarantine period to observe the results of the vaccination exists. The Ministry of Agriculture and Livestock employs four veterinarians and six vaccinators whose services are free to the livestock industry. It also sells vaccines at cost prices. The official vaccinators carry out the following vaccinations: cattle, against anthrax, blackleg, haemorrhagic septicemia and pneumo-enteritis; horses, against anthrax and with mixed bacterin; hogs, against cholera, haemorrhagic septicemia and with mixed bacterin.

The new National Livestock School of Santa Ana, El Salvador, was inaugurated on 10 March, 1954. Up to May, 1955, there had been seven terms from which 137 people graduated. The school is having wide acceptance by farmhands and farmers who want their people to learn how to produce cleaner milk and take better care of animals. The school has accommodation for 40 students, a service area of roughly 24,000 sq. yds. and 5 ha. for cultivation and to keep the 11 animals it owns. These include one bull of each of the following breeds: Holstein, Brown Swiss, Guernsey and Jersey and seven cows. Instruction, quarters and food are provided free of charge and the only requisites for admission are good health, good conduct and ability to read and write. The teaching staff is composed of employees of the Ministry who do not receive any extra pay for this work. The courses are of a duration of three weeks and cover theoretical and practical aspects of the management of dairy cattle and of the production of milk. The Ministry also offers a two weeks' course on artificial insemination.

In the French territories in Latin America, the services to agri-

culture and livestock industry are undergoing a process of reorganization, following a change of status of these territories in relation to France. As a consequence, whereas the technical departments formerly were all responsible to the Ministry of Colonies, each of them is now directly responsible to the specialized ministry concerned. In *French Guiana*, the Agriculture and Forestry Agency was recently created dependent on the Ministry of Agriculture of France. This Agency, which will be responsible for action in agriculture in French Guiana, is at present engaged in surveys on which to base its program, and it has recently created an experiment station for livestock and fodder research. This station has initiated a program of crosses of local cattle with Brown Swiss, which appears to be giving good results. This station is still rather modest, but enlargement is expected. The Agency will also assist private enterprise through advice, demonstrations and other extension activities.

In *Peru*, the need for more adequate staffing of national services of the livestock industry is recognized. Well trained and capable technicians can only become available if the educational institutes of the countries are well organized and equipped, and if their programs are adapted to real needs of the countries. The observation applies equally to many countries in which adequate numbers of trained workers are not yet available.

In *Venezuela*, the Livestock Division of the Ministry of Agriculture comprises three departments which are responsible for dairy cattle and hog development and for herdbooks respectively. The Ministry has established a program to increase the number of animals also the yield per head. The first of these objectives is very difficult due to the lack of adequate pastures on the *sabanas* of the cattle areas. For this reason, it is essential first to improve and extend the pastures and to solve the problem of periodical floods, and then to carry out complementary measures, such as fencing and adequate water provision. An intensive crossbreeding campaign to raise production is at present under way, and has already given very good results. Thus, for instance, the 4-year-old native animal gives a carcass yield of 352 lb. while the native zebu crossbreeds of 2½ years yield 484 lb. It is expected that the number of crossbreeds will be increased by 400,000 at the end of five years. The Ministry of Agriculture has imported a substantial number of zebu bulls which are crossed on native cows at the experimental stations of San Carlos and Pariaguan; the offspring of these crosses are sold to livestock breeders at low prices or on credit.

In *British Honduras*, owing to the limited facilities and available staff, only preliminary studies of the problems affecting the livestock industry have so far been carried out. The general

recommendations on the subject of the Baurú meeting are, however, borne in mind.

In *Trinidad and Tobago*, the need for the establishment of an adequate and efficient extension service of the Department of Agriculture on the livestock side is appreciated and efforts are being made to provide officers with increased training in animal husbandry. Also, arrangements are now under consideration whereby financial assistance will be given to approved livestock owners in the form of subsidized prices for certain classes of livestock.

In the *United States of America*, a number of improvements in the extension or education services to the livestock industry have taken place in recent years.

The Federal Market News Service was created as a neutral agency to obtain information on marketing, movements, prices and price trends on livestock and meats, for dissemination to all interested persons. From its inception nearly 40 years ago at eastern wholesale meat centers and Chicago, it has gradually been expanded to its present coverage of 35 public livestock markets, 6 large wholesale meat centers and the national wool trade reported from a central point. The gradual drifting of the slaughter industry into some of the leading livestock producing areas of the country resulted in an increased proportion of all livestock being sold direct from producers to packers. In order to report such transactions, the Market News Service extended its coverage into two such direct marketing areas. Information on country trading in important cattle and sheep range areas in the western part of the United States of America is assembled in a single report each week. At present about 150 persons, including the clerical and statistical staff, are employed in Federal Market News work. This service includes the collection and distribution of information number of livestock received at the markets each day, prices paid by species, grade and weight, and the price trend compared with the previous day. Information is also collected on the supply, demand and price situation in the wholesale meat and wool trades. This information is disseminated through press associations, newspapers, by direct mail and on radio and television. There is considerable demand for an expansion of the service to include more reports on direct sales, as well as more coverage of local livestock markets and auctions. The development of thousands of local livestock auctions during the past 25 years makes market news coverage both difficult and expensive. There are a number of projects designed to study these needs for additional market news services, and to suggest practical methods of effecting increased coverage.

A second service in the United States of America is the Federal Meat Grading Service. This is voluntary and available to packers, wholesalers and retailers on a fee basis. During World

War II and the recent Korean conflict, federal grading was conducted on a compulsory basis. At present there are about 350 persons grading meat and another 50 persons employed in a supervisory capacity. Nearly 50 percent of the commercial production of beef, veal, lamb and mutton is federally graded. Many firms in the meat packing, wholesaling and retailing industry use federally graded meat as a basis for comparing values and for trading in the market places. In addition, some of the larger retailing chain organizations rely on federally graded meats for developing consumer confidence in their retail meat merchandizing program. Improvements in the grading service have been largely in the area of improved understanding of what are the standards for grades; and what the grade means in terms of variations in cooking techniques for each cut from each grade. Many in the meat industry feel that the increased percentage of the consumer's meat dollar being spent for beef is in part a result of increased use of beef grades as a basis for retail selling. Some students of the problem feel that the establishment and use of grades on pork cuts might help the swine industry recover some of the consumer confidence that has been lost through the sale of pork cuts containing an excessive amount of fat.

A third major service provided for the livestock industry is the livestock disease and pest control work, including the quarantine activity. During 1954, the Federal Government provided approximately 1,330 man-years on disease control and disease eradication work. The total expenditure of funds on this particular program would amount to somewhat less than one-tenth of one percent of the value of the livestock sold by farmers during the year.

Another service provided the livestock and meat industry is work with packers and stockyards. Financial, weight and price protection is furnished the producers of livestock and poultry at public stockyards, livestock auction yards and poultry markets, through enforcement of the Packers and Stockyards Act. This Act is designed to assure producers of livestock the full true market price for their animals. The following measures assist in accomplishing the purpose of the Act: open competitive bidding, accurate weights, correct accountings, adequate marketing facilities, services at reasonable rates, protection against unjust practices and full bond protection of their proceeds of sale. This latter bond protection is an insurance against losses due to misuse of proceeds of sale. More than 2,000 scales on which livestock and poultry are weighed, must be tested and inspected at regular intervals. Bonds are required of about 4,000 agencies selling livestock on a commission basis, as well as all dealers buying livestock. Approximately 80 employees are engaged in administering the provisions of this Act at 62 terminal stockyards, 271 auction yards, and 8

designated poultry markets. The total cost of this protection totals about 1/1,000 of one percent of the value of all livestock sold.

In the field of livestock and meat research in the United States of America the federal and state governments combined provide a vast amount of service to the livestock industry. Much of the work in breeding, feeding and management is done in the state experiment stations and sub-stations; these former are doing livestock research under local pasture, roughage and grain production conditions. The U.S. Department of Agriculture provides some co-ordinating services for this research work. In addition, the Department as well as the state colleges do research in livestock and meat marketing. Improvements in the research work for livestock are many and varied. One example is in the methods of evaluating hog breeding stock for muscle *versus* fat. At least one midwestern state university has recently developed an electronic needle for measuring the depth of back fat on hogs. This might well be a major factor in the improvement of the method of selecting hog breeding stock for meatiness. In the beef industry much attention is being given to the problem of breeding animals that will produce a higher percentage of the more desirable beef cuts, make gains with less feed costs and make better use of pasture in the hot and humid areas in the Gulf Coast. In the marketing field, much research is being done to find out what consumers want in their meat supply. Of particular interest to research is the problem of getting the livestock and meat marketing system to more accurately reflect in the live animal market consumer preferences for the various grades of meat.

The educational services rendered to the livestock industry involves the application of research results in all fields, from breeding to marketing. It also includes the educational work involved in interpreting the regulatory activities of the federal and state governments as they apply to the livestock and meat industry. This educational program poses the very real problem of how to transfer facts and skills developed by the research workers in such a manner that they can be understood, learned, remembered and used by farmers, marketing agencies, processors and retailers. In the United States of America in 1954, country agricultural extension workers devoted a total amount of time equivalent to 1,370 man-years to work with the 4 million livestock producers. There have also been approximately 130 persons devoting full time to livestock production and marketing work on the 48 state extension staffs. The combined work of these state and country workers amounts to only 1 person for each 2,500 livestock producers in the whole country. It should also be noted that these workers also devote some time to the educational work

with market agencies, meat processors and meat retailers.

During the last 8 years the United States has also expanded its educational program among consumers. The general objective of the consumer education program is one of providing consumers with information which will enable them to utilize their meat dollars better in retail stores. More specifically, this educational program among consumers is designed to provide them with information on grades and cuts of meat available, as well as information on seasonal fluctuations in price and supply. Production of red meats has expanded at a much greater rate than the population. Thus, while consumption was less than 130 lb. per capita in the 1930's, it is now well over 150 lb. of red meat. With an ever expanding industrial or urban population, the demand for meat has increased. If the livestock industry is going to provide the meat that is so essential for a vigorous and productive working population, livestock production and meat distribution will need to be expanded and improved at an ever increasing rate. It should be pointed out that, as the slaughter of livestock moves closer to production areas, there is an increased need for market news and meat grading, as well as improved transportation. All of these things facilitate the merchandizing or marketing of meats in consuming centers some distance from the point of production, marketing and slaughter.

A review of the history of the educational program would indicate that the demonstration technique still holds great promise. The educator must find the job that needs to be done, the research that needs application and then provide the industry, or individuals in the industry, with a picture of those needs. There must be found some way to make those improvements wanted. Possibly, they may be wanted to provide a new pair of boots for the producer or a new dress for his wife; the main point, however, is that he must "want" an improvement. The extension job among livestock producers is one of getting producers to understand the value of better breeding, feeding, management and marketing. It has been found that the educational worker must have the vision to look a long way ahead for results. He must have the knowledge to realize what is sound in the long run. He must know what is good business, what is practical, he must have the sympathetic understanding of the people with whom he is working. Thus, to get results, to get application of research, it would seem essential that people be trained who have an understanding of the persons to be taught. They must be given that training which will enable them to transfer facts and skills developed by the research workers in the livestock industry. The educator must know how to be understood, how to get people to learn, remember and use facts if this program is to be effective.