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REPORT OF THE PRESENT SITUATION, ACTIVITIES AND RECOMMENDATIONS

COLLEGE OF AGRICULTURE

With Particular Reference to the Livestock Department

SEOUL NATIONAL UNIVERSITY
SUWON, KOREA

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TABLE OF CONTENTS

	<u>Page</u>
I. THE PRESENT SITUATION	2
1. Brief history review	2
2. Organization of the College of Agriculture	3
3. The physical plant of the Livestock Department	4
4. Equipment	5
5. Land area	5
6. Livestock and poultry	5
7. Library	5
8. Admission of students	6
9. Present enrollment	7
10. Placement of graduates	7
11. Curriculum in livestock	7
12. The Graduate School	12
13. Research completed or in progress	14
14. Personnel of the Livestock Department	16
15. Other agricultural colleges	18
16. Agricultural high schools	18
17. Central Agricultural Institute	18
18. Agricultural cooperatives	19
19. Summary statement of the current situation	19
II. ACTIVITIES OF THE ADVISER.....	20
1. Introduction	20
2. Instruction problems	20

	<u>Page</u>
3. Institutions and organizations visited in Korea.....	21
4. Talks or lectures made in Korea	22
5. Conferences with USOM and Ministry of Agriculture and Forestry personnel	23
6. Equipment needs of the Livestock Department	23
III. RECOMMENDATIONS	24
1. General, with reference to the entire College	24
2. Pertaining to the Livestock Department and curriculum..	26
3. General, with regard to Korean livestock	28
IV. APPENDIX	30
1. Agricultural colleges in Korea	30
2. Central Livestock Experiment Station and branches	32
3. Requested equipment for the Livestock Department	33
4. Acknowledgments	36

I. THE PRESENT SITUATION

The College of Agriculture, Seoul National University, has made remarkable progress in rebuilding and expansion in the recent phase of its growth dating from September 1952.

A well established reputation as an outstanding educational institution has been achieved in a relatively short period of time. The impressive college buildings and grounds, the well trained staff and fairly adequate equipment are quite apparent to even a casual observer. The progress made is indicated by the chronological development of the institution.

1. BRIEF HISTORY REVIEW

There follows a brief historical review of the College of Agriculture adapted from "Brief Sketches of the College of Agriculture" prepared by Dean Baik Hyun Cho.

- 1906: The School of Agriculture and Forestry was founded at Suwon on September 10, separated from "The School of Agriculture, Commerce, and Technics" which had been established at Seoul in 1904.
- 1910: Korea was occupied by Japan, incidentally the School was run under Japanese control.
- 1918: The School was raised to the status of college and named "The College of Agriculture and Forestry." There were two departments in the College: Department of Agriculture and Department of Forestry.
- 1937: The Department of Veterinary and Livestock was established.
- 1945: The Department of Agricultural Engineering was established.
- 1945: On August 15 Korea was liberated from Japan.
- 1946: Seoul National University was inaugurated and the College of Agriculture became an integral part of it. At the same time the Departments of Agricultural Chemistry, Agricultural Economics, and Agricultural Biology were established and the Department of Veterinary and Livestock was separated into the two Departments of Veterinary and Livestock.
- 1950: On June 25 the North Korean army invaded South Korea.
- 1952: During the Korean War the College moved to Pusan and lectures were resumed temporarily under the United University in Pusan. On September 23, 1952 the College returned to its normal status. Considerable war damage had occurred during the War.
- 1952-53: Members of the FOA/UNKRA Mission to Korea made an important recommendation to rehabilitate the College of Agriculture in Suwon as a unique and complete national College of Agriculture. "The Mission recommends therefore that the College of Agriculture at Suwon be

developed into the one strong National College of Agriculture. It is recommended that this school be provided with all facilities necessary to maintain a student body not to exceed one thousand, who can be given the best in scientific agricultural training . . ." Quoted: UNKRA, Agriculture Forestry and Fisheries in South Korea, Columbia University Press, 1954, p. 187.

1953-54: UNKRA aided to rehabilitate the damaged Physical Plant.

1954: Contract was entered into between ICA (at that time FOA) and the University of Minnesota to aid the rehabilitation and raise the standard of Seoul National University involving three Colleges - Agriculture, Engineering and Medicine.

1955: More than ten staff members from the College of Agriculture went to the University of Minnesota for the first year of the cooperative project, and the personal exchange programs have continued for three years with a total of twenty-nine participants from the College of Agriculture receiving training at the University of Minnesota. Eight staff members from the University of Minnesota have come to the College during the three-year project.

1956: Department of Sericulture was established.

1957: The extensive building construction of the College was started and the College was definitely changed from its old and war-damaged phase to a modern, well equipped institution. The cooperative project with the University of Minnesota was extended for two more years.

1959: The Department of Home Economics was established. A further extension of the Minnesota cooperative project was consummated. Extensive renovation of the old buildings, erection of the chemistry building, completion of the power plant, rebuilding of several quonset structures as work shops and livestock pavilion, improvement of the roads and grounds particularly in drainage, and fencing is currently in progress.

2. ORGANIZATION OF THE COLLEGE OF AGRICULTURE

(1) The College of Agriculture is divided into nine departments as follows:

1. Agriculture
2. Forestry
3. Livestock
4. Agricultural Engineering
5. Agricultural Chemistry
6. Agricultural Economics

7. Agricultural Biology

8. Sericulture

9. Home Economics

(General basic courses common to all departments are handled separately.)

- (2) The administration staff consists of:
Dean of the College of Agriculture: Baik Hyun Cho.
Director of the Registration Section: Chong Supp Shim
Director of Student Affairs Section: Sung Chi Cho
General Business Manager: Kyung Jo Chung
- (3) The academic staff, which consists of fifty-four members of the rank of Instructor or above, is made up of eighteen Instructors, thirteen Assistant Professors, eight Associate Professors and fifteen Professors.
- (4) The technical aid program made provision for Seoul National University staff members to study in the United States. To date under this program there have been forty-one participants from the College of Agriculture, amounting in time to approximately sixty-eight man-years. This phase of personnel exchange is being continued with thirteen College of Agriculture staff members still pursuing graduate studies in the United States. Of the twenty-eight staff members who have completed their graduate study programs and returned to Korea, sixteen have received M.S. degrees and three Ph.D. degrees. All except one of the seven Livestock Department staff members have studied or are studying in the United States.
- (5) Livestock Department personnel are discussed on page 17.

3. THE PHYSICAL PLANT OF THE LIVESTOCK DEPARTMENT

In the fall of 1959 the main offices and laboratories of the Department were moved to the second floor of the new main building. Seven offices, twelve by twenty-four feet with suitable office furniture, are occupied by Department members and graduate students. Four laboratories are adjacent to the staff offices. The two larger ones, twenty-two by twenty-six feet, are assigned to Animal Breeding and Animal Nutrition. The two small laboratories, twenty-four by twenty feet, are for Poultry and Dairy Husbandry. The other structures used by the Department are described as follows:

An old office and laboratory building which is a long, one-story, wooden structure 30' X 115' with a tile roof.

The farm buildings are:

- (1) One chicken house, 20' X 55', wooden construction, "lean-to" type with a sheet metal roof
- (2) The original poultry barn, 20' X 65', having a head house with lean-to tiled roof, with walls made of mud and covered with a cement mixture
- (3) A hatchery 18' X 25' with brick side walls and tiled roof
- (4) Dairy processing house 24' X 45', wooden construction, and a tiled roof

- (5) Swine barn 24' X 60', wooden construction with a sheet metal roof.
- (6) Two Korean-type houses occupied by employees, these houses being adjacent to the above mentioned structures.
- (7) A silo 15' in diameter and 32' high.
- (8) A livestock shed 40' X 100'.
- (9) A quonset building is being remodeled into a judging pavilion and storage unit.

A new swine barn is in the blueprint stage. The buildings are quite adequate for the existing livestock population which is much too small.

4. EQUIPMENT

The equipment available is fairly adequate at the present time. As livestock numbers are increased and the research program expanded more equipment will be necessary. There are some items suggested in recommendations which will add to the teaching efficiency in the Department.

5. LAND AREA

Livestock Department facilities are quite inadequate with the exception of offices and laboratories. The deficiencies are particularly in land and livestock. The land area for livestock is only about ten chongbos or twenty-four and one-half acres; one-fifth is upland for feed production and the balance is farm and pasture land. If livestock numbers are increased, more land would be needed for feed production and more funds required for feed purchases.

6. LIVESTOCK AND POULTRY

The Livestock Department currently has 3 draft cattle, 10 dairy cattle, 1 horse, 4 sheep, 5 goats, 18 swine, and 195 poultry. More livestock and poultry would improve undergraduate and graduate instruction as well as make material available for research projects.

7. LIBRARY

The library is a one-story building with a total area of slightly less than 6000 square feet, about one-third of which was a new addition in 1957. The main reading room of about 2304 square feet is equipped with 16 tables which seat 4 persons each, or a total of 64 persons. One section with two tables is set aside with movable partitions for use of ladies and a similar section is available for faculty members. There are two stack rooms and a lending room in addition to the office. The physical facilities appear to be fairly adequate in size. The heating facilities, when complete, will add to the comfort of the patrons. The lighting could be improved; and the removal of shoes at the door is somewhat inconvenient.

The number of books as of January 25, 1960 is 24,166 which includes bound periodicals. Of these 13,518 are Japanese, 2,520 Korean and 8,128 occidental. The latter are mostly from the United States and are relatively new. ICA has provided 2,866 new books, UNKRA 1,788, UNESCO 167, CARE 93 and other sources 20. There are 193 periodicals being received, 104 of which are provided by ICA. There are on hand a sizeable number of unbound periodicals.

Library personnel consists of the Director, Prof. Seung Kyu Rhee, who devotes one-third of his time to the library and two-thirds to teaching Animal Husbandry, and four other employees. One of the latter has had some basic training in library procedures. The library has an author index and subject matter, or title, index. One set of the indices is for the patrons and another for the staff.

It was estimated by the Director that during the regular school year the average number of students using the library daily is about thirty. Entering freshmen are informed about the library during the three-day orientation period. There is need for greater use of the library by students to the end that graduates are familiar with its functions and know how to use library facilities for independent study and investigation.

The library is open daily from 8:30 a.m. to 5:00 p.m. except Sunday during most of the year, but the closing time is 8:00 p.m. during the spring and summer.

Library needs have been discussed with the Director, faculty and students. Their suggestions, along with some of the writer's, are included later in the report. Certainly expansion of the library in reading material should be the first consideration to keep pace with the intellectual growth of the institution. The library will eventually require more space.

8. ADMISSION OF STUDENTS

The number of entering students is limited by law to three hundred per year for the College of Agriculture. Of this total, the allotment to the Livestock curriculum is forty. Selection is by entrance examination. The number of applicants and the number admitted to the College and the Livestock curriculum for two school years are tabulated below.

<u>Year</u>	<u>Number of Applicants</u>		<u>Number Admitted</u>	
	<u>Total</u>	<u>Livestock Curriculum</u>	<u>Total</u>	<u>Livestock Curriculum</u>
1958	1017	171	270	35
1959	933	146	283	34

9. PRESENT ENROLLMENT

Following is the tabulated current enrollment in the College by classes and departments:

Number of Students Enrolled at the College of Agriculture
Seoul National University
by Classes and Department
(as of January 15, 1960)

<u>Department</u>	<u>Sex</u>	<u>Freshman</u>	<u>Sophomore</u>	<u>Junior</u>	<u>Senior</u>	<u>Total</u>
Agriculture	Male	37	34	49	22	142
	Female	-	2	1	2	5
Forestry	Male	26	22	43	9	100
	Female	-	-	-	-	-
Livestock	Male	28	30	42	16	116
	Female	-	-	-	2	2
Engineering	Male	37	25	38	23	123
	Female	-	-	-	-	-
Chemistry	Male	30	23	35	16	104
	Female	2	-	2	1	5
Economics	Male	34	23	41	21	119
	Female	-	-	-	-	-
Biology	Male	30	28	26	12	96
	Female	-	-	3	3	6
Sericulture	Male	20	14	24	13	71
	Female	-	1	-	-	1
Home Economics	Male	-	-	-	-	-
	Female	13	-	-	-	13
Total	Male	242	199	298	132	871
	Female	15	3	6	8	32
						903

10. PLACEMENT OF GRADUATES

A report from the Seoul National University Press on May 25, 1959 indicated that ninety-two per cent of the graduates from the College of Agriculture were gainfully employed. Recently Prof. Won Song Yun reported that of 166 graduates from the Livestock curriculum for the five-year period 1955 to 1959, seventy per cent are employed by various governmental or private organizations, twenty per cent are in the armed services, and ten per cent are engaged in farming.

11. CURRICULUM IN LIVESTOCK

A common first-year curriculum is followed by all students in the various curriculums in the College of Agriculture. A total of 160 semester credits with an average grade of C is required for graduation with a B.S.

degree. Of the total, 131 credits are in required courses in the Livestock curriculum.

Following is the curriculum used by the Animal Husbandry students including elective as well as the required courses:

Freshman Year

Course Number	Course Title	First Semester		Second Semester	
		Credits	Lecture	Credits	Lecture
-102	Korean		()Lab.	4	4(0)
103-104	English	4	4(0)	4	4(0)
105	German	4	4(0)		
-108	Outline of philosophy			4	4(0)
109	History of civilization	4	4(0)		
-112	Outline of natural science			4	2(0)
113	Physical training	2	4(0)		
115	Principles of economics	2	2(0)		
117-118	Mathematics	2	2(2)	2	2(2)
119	Physics	2	3(3)		
-122	General chemistry			2	3(3)
123	Botany	2	3(3)		
-126	Zoology			2	3(3)
Total		22		22	

Sophomore Year

Course No.	Course Title	First Semester		Second Semester		Remarks
		Credits	Lecture	Credits	Lecture	
L 261	Anatomy of domestic animal	4	3(3)			Required Course
L 262	Physiology of domestic animal			4	3(2)	"
L 202	Livestock judging			3	2(2)	"
C 223	Soil science			3	2(2)	"
C 201	Organic chemistry	4	3(2)			"
L 206	Poultry judging			3	2(2)	"
B 243	Genetics			3	2(2)	"
Ec205	Statistics	3	3(0)			"
L 201	Rabbit production	3	2(2)			"
Total		14		16		
L 263	Livestock bacteriology	2	2(2)			Elective Course
L 204	Breeds of livestock			3	3(0)	"
	Outline of agronomy	2	2(2)			"
	Outline of horticulture	2	2(2)			"
C 215	Qualitative analysis	1	0(3)			"
C 226	Fertilizers			2	2(2)	"
En206	Meteorology			2	2(2)	"
Ec241	Outline of laws	2	2(0)			"
F 295	Outline of forestry	2	2(2)			"
B 225	Outline of entomology			2	2(2)	"
S 201	Outline of sericulture			2	2(2)	"
Total		11		11		

Junior Year

Course No.	Course Title	:First Semester:		:Second Semester:		Remarks
		:Credits:	:Lecture:	:Credits:	:Lecture:	
L 305	Poultry production	4	3(2)			Required Course
L 305	Swine production	4	3(2)			"
L 322	Feeds and feeding			4	3(2)	"
L 323	Animal breeding I (physiology of reproduction)	4	3(2)			"
L 344	Meats			3	2(2)	"
L 306	Cattle production			4	3(2)	"
L 310	Horse production			3	2(2)	"
: Total:		: 12	: 14	: 14	: 14	
Ec242	Constitutional law	3	3(0)			Elective Course
A 324	Forage crops	3	2(2)			"
B 441	Experiment statistics	4	3	3(3)		"
L 365	Livestock diseases	2	2(2)			"
C 203	Biochemistry (I)	3	2(3)			"
Ec341	Administrative law			3	3(0)	"
EC202	Farm management (1)			2	2(2)	"
En342	Soil conservation			4	3(2)	"
Ec201	Agriculture economics (1)			3	3(0)	"
: Total:		: 15	: 12	: 12	: 12	

Senior Year

Course No.	Course title	First Semester Credits	First Semester Lecture	Second Semester Credits	Second Semester Lecture	Remarks
L 408	:Sheep and goat production	3	2(2)			Required course
L 411	:Dairy cattle	4	3(2)			"
L 424	:Animal breeding II(Genetics)			3	2(2)	"
L 442	:Poultry products			3	2(2)	"
L 446	:Dairy processing			3	2(2)	"
L 425	:Poultry Breeding	3	2(2)			"
L 412	:Livestock management			4	4(0)	"
L 427	:Poultry nutrition	3	2(2)			"
L 491	:Seminar	1	0(3)	1	0(3)	"
L 464	:Animal hygiene			3	2(2)	"
: Total:		14		17		
L 428	:Animal nutrition	3	2(2)			Elective course
L 429	:Range management	2	2(0)			"
402	:Pedagogics			3	3(0)	"
Ec403	:Agriculture extension	2	2(0)			"
L 441	:Tanning	3	2(2)			"
B 329	:Apiculture	2	2(2)			"
C 401	:Nutrition chemistry			2	2(0)	"
C 404	:Food chemistry	3	3(0)			"
B 414	:Cardening			2	2(2)	"
: Total:		15		7		

12. THE GRADUATE SCHOOL

The graduate work in the Agricultural College and the Livestock Department is still in the beginning stage as the graduate school of Seoul National University is comparatively new. Students wishing to take advanced work are required to take a graduate school entrance examination, which is usually held in March. More than half of the students who have taken the examination have failed to qualify.

The number of graduate students enrolled at the College of Agriculture at the present time is 21, of which 5 are in the Livestock Department. A series of courses has been set up for graduate students in the Department. Instruction for the masters degree consists of course attendance, conferences with staff members, the preparations of reports, and a satisfactory thesis. The candidate is also required to pass examinations.

Following is a list of graduate courses offered in the Livestock Department with brief statements of the material in each course:

101. Advanced Animal Nutrition I

Functions and metabolism of protein, carbohydrate, and fat in animal body. Relation of chemical composition of feeds to their function in the animal body.
(3 cred.)

102. Advanced Animal Nutrition II

Properties, functions, requirements, and interrelationship of mineral matters, vitamins, and some feed additives for farm animals.
(3 cred.)

103. Advanced Feeds and Feeding

Feeding standards and nutritive ratio. Nutrition of farm animals with particular reference to cattle, sheep, and swine.
(2 cred.)

104. Poultry Nutrition

Nutritional requirements of poultry. Formulation of rations. Nutritional deficiency.
(3 cred.)

303. Advanced Milk Products

Intensive review of general problems and literatures related to milk and its products. Laboratory work is involved.
(3 cred.)

304. Advanced Poultry Products

Technology involved in grading, processing, packaging, storage, and merchandising of poultry, meat and eggs.
(3 cred.)

305. Wool and Tanning

Physical and chemical structure of wool; preparation and marketing, judging, grading, scouring, and manufacturing of wool. Preparation and marketing of hides, skins, and furs. Grading and tanning.
(2 cred.)

401. Seminar in Livestock and Poultry

Problems assigned to fit the needs of the students.
(1 cred.)

402. Research in Livestock and Poultry

Problems assigned to fit the needs of the students.
(1 cred.)

204. Advanced Animal Breeding III

The physiological mechanisms related to reproduction, breeding efficiency, and fertility with special reference to domestic animals and embryology of farm animals.
(3 cred. prereq: animal physiology, biochemistry)

205. Advanced Poultry Breeding

Principles of genetics and physiology of reproduction as applied to the breeding of poultry.
(2 cred.)

301. Advanced Meats

The wholesale cuts and grades of meat; the structure, composition and post-mortem changes of animal tissue; methods of handling, processing, and evaluating quality of meat.
(3 cred.)

302. Advanced Processing and Storage of Meats

Antibiotic treatment, vascular poking of antibiotics, meat powder, drymeat, and cold storage with special reference to food technology and biochemistry.
(3 cred. prereq: advanced meats, biochemistry)

105. Range Management

Technology involved in improvement and management of range and stock.
(3 cred.)

201. Artificial Insemination

Lectures and laboratory on fundamentals and techniques involved.
(3 cred., prereq; animal breedings, animal physiology, and animal anatomy.)

202. Advanced Animal Breeding I

Application of the physiology of reproduction and of genetics to breeding of farm animals.
(3 cred., prereq: biochemistry, genetics, animal physiology.)

203. Advanced Animal Breeding II

Practical application of genetics to the improvement of various classes of livestock. Calculating and discussing of coefficient of inbreeding, heritability and analysis of covariance.
(3 cred., prereq; advanced animal breeding II, zoology, genetics and biostatistics.)

13. RESEARCH COMPLETED OR IN PROGRESS

Some research work is being carried on by the members of the Livestock Department. While the primary duty of staff members is that of resident teachers, most of them are conducting some research, as they realize that in so doing their professional standing will be enhanced and their teaching improved. The facilities available are not the best for extensive research in most areas, yet investigations with livestock and poultry are possible even with small numbers, and if carefully controlled, can yield statistically significant results.

In the complete separation of research, extension and resident teaching, all areas suffer. It is hoped that this separation will be more easily bridged in the future than it has been in the past. Two livestock department members are serving on projects as cooperators under the Institute of Agriculture, which is a move in the right direction.

As will be noted in the tabulation of research projects and the reports given, staff members are active in meetings of the Korean Livestock Society, in the Korean Agricultural Society, and in short courses for livestock specialists. They are also active in preparing papers for scientific publications.

Following is a current summary of research completed or in progress by staff members:

Research Projects in the Department of Livestock,
College of Agriculture, Seoul National University

<u>Title</u>	<u>Staff member in charge</u> (Coworker)	<u>Report</u>	<u>When Initiated</u>
Feeding value of acacia leaf meal for growing pigs	Prof. Sang Won <u>Yun</u>	Korean Society of Animal Science	1958
A. I. of Swine in Korea	Prof. Yong Bin <u>Lee</u>	Journal of Seoul National Univ.	1956
Stilbestrol implantation to cockerel	Prof. Yong Bil <u>Lee</u> Y. I. <u>Park</u>	"	1959
Inducing lactation from Korean cattle	Prof. Yong Bin <u>Lee</u>	Not reported	1960
Growth stimulation of Korean cattle by hormone implantation	"	"	1960
A study on the shrinkage in the processes of press ham	"	Korean Society of Animal Science	1959
Study on the influence of cutting chick wings on egg production	Associate Prof. S. K. <u>Rhee</u>	Not reported	1959
Historial study for Korean native cattle	Associate Prof. Chong Yung <u>Yuk</u>	Livestock Farming	1952
Study on calf starter to dairy cattle	"	Bul. of Agr. Exp. Sta.	1948
Study on optimum seeding time of the imported grasses & legumes in Korea	"	"	1948
Digestion trial on wild grass hay with sheep	"	Unpublished	1959
A study of hybrid poultry	Assistant Prof. Bong Kug <u>Ohh</u>	M.S. thesis, SNU	1954

<u>Title</u>	<u>Staff member in charge</u> (Coworker)	<u>Report</u>	<u>When Initiated</u>
Genetic relationship between colar gene & growth rate in chicken	Assistant Prof. Bong Kug <u>Ohh</u>	Korean Society of Animal Science	1958
Performance testing with University of Minnesota inbred lines	"	"	1959

14. PERSONNEL OF THE LIVESTOCK DEPARTMENT

The instructional staff is made up of 9 members, 2 Professors, 2 Associate Professors, 1 Assistant Professor, 2 Instructors and 2 Assistants. The staff of this department is a well balanced group for the teaching of all phases of animal science, with the exception of such veterinary subjects as Anatomy, Physiology and Hygiene. For the most part they are well trained and well suited to serve as instructors of college grade subject matter. As the graduate program is developed and training for the doctorate degree made available, staff adjustments will be needed. This will be the case if much basic research is contemplated. The Department works well as a team; further, they are enthusiastic about their work. The individuals are very cooperative and receptive to new ideas and methods. They are especially eager to get new subject matter which is difficult for a staff member to secure.

Two of the staff members are teaching one day a week in the College of Veterinary Medicine of Seoul National University and two are cooperators on research projects under the Institute of Agriculture. As indicated previously, all staff members of Instructor grade or higher, except one, have had training at the University of Minnesota, and three have attained the Master of Science Degree.

Following is a listing of faculty members of the Livestock Department, showing age, title and trainings:

Faculty of The Livestock Department
College of Agriculture, Seoul National University

Sang Won, Yun (61):

Head of the Department; Professor of animal feeding and animal husbandry; B.S. (1933) M.S. (1934) at Texas A. & M. College; studied at the Texas A. & M. College for 5 years under private sponsorship; studied at the Institute of Agriculture, University of Minnesota, in 1956 for 6 months under ICA sponsorship.

Yong Bin, Lee (45):

Professor of animal breeding and animal husbandry; B.A. from the Agricultural & Forestry College, Tokyo, Japan 1938; M.S. from the Institute of Agriculture, University of Minnesota 1955; studied at the Institute of Agriculture, University of Minnesota for 19 months under Korean Government and ICA sponsorship.

Saung Kyu, Rhee (51):

Associate professor of poultry husbandry; B.A. from the Suwon Agricultural & Forestry College 1933.
In charge of College Library.

Chong Yung, Yuk (38)

Associate professor of dairy husbandry; B.A. from the Suwon Agricultural & Forestry College 1934; M.S. from the Institute of Agriculture, University of Minnesota 1958; studied at the Institute of Agriculture, University of Minnesota, for 1 year under ICA sponsorship.

Bong Kug, Ohh (37)

Assistant professor of poultry breeding; B.A. from the College of Agriculture, Seoul National University, 1952; M.S. from the Graduate School, Seoul National University 1956; studied at the Institute of Agriculture, University of Minnesota for 2 years under ICA sponsorship; M.S. from the Institute of Agriculture, University of Minnesota 1957.

Kae Won, Song (38)

Instructor of animal physiology and animal anatomy; B.A. from the Suwon Agriculture and Forestry College 1948; now studying at the Institute of Agriculture, University of Minnesota under ICA sponsorship.

Yong Sang, Lee (32):

Instructor of Animal nutrition; B.A. at the College of Agriculture, Seoul National University, 1953; studied at the Institute of Agriculture, University of Minnesota for 2 years under ICA sponsorship.

Suk Hyon, Han (29):

Assistant in animal feeding; B.A. at the College of Agriculture, Seoul National University, 1956; now enrolled in the Graduate School, Seoul National University.

Young Il, Park (23):

Assistant in animal breeding; B.A. at the College of Agriculture, Seoul National University, 1959; now enrolled in the Graduate School, Seoul National University.

15. OTHER AGRICULTURAL COLLEGES

There are numerous agricultural colleges in Korea. Fourteen are active at the present time, 5 of which have established Departments of Livestock or Animal Husbandry, and in some instances Veterinary Medicine and Animal Husbandry are included in the same department.

There appears in the appendix a list of Korean agricultural colleges, their locations, the departments included and a classification of the institutions into National, Provincial or Private.

16. AGRICULTURAL HIGH SCHOOLS

There are numerous agricultural high schools in Korea. At the present time the number of active high schools classified as agricultural is 128, with a staff of instructors numbering 1,467. Many of these high schools have rather complete facilities; for example, the Suwon Agricultural and Forestry High School has a student body of 945 with a faculty of 39 members. They have a farm upon which are raised swine, poultry, goats and some cattle. Apiculture, Sericulture and Fish Raising are included in the curriculum.

17. CENTRAL AGRICULTURAL INSTITUTE

The Central Agricultural Institute is under the Ministry of Agriculture and Forestry, whereas the College of Agriculture of Seoul National University is under the Ministry of Education. The Central Agricultural Institute, which includes the National Agricultural Research Program and the Rural Extension Education Program, is located at Suwon near the College of Agriculture. The Institute was rebuilt following the war and is still in the rebuilding stage. American and Korean technicians are working through the USOM Agricultural Division and the Ministry of Agriculture and Forestry to reestablish the National Research Program and the Rural Extension Service. There are 167 agricultural extension agents (senior grade) in all the provinces and guns (counties). There are also 94 trained Home Economics agents at the national and provincial levels.

Included in the extension work are more than 7,000 active 4H clubs, with a membership of over 200,000.

The research program in Animal Husbandry is carried out at the central station and branch stations, the listing of which is included in the appendix of this report page 30.

18. AGRICULTURAL COOPERATIVES

There has been an extensive expansion of Agricultural Cooperatives in Korea, following promulgation of the Agricultural Act in 1957. Recent reports indicate that there have been 17,577 village level and 166 county level cooperatives organized. Some are going organizations of long-standing, while many are passing from the organization stage to the operating stage.

These Cooperatives will serve their constituents by developing marketing systems, including storage facilities, and will provide for joint purchase of agricultural supplies, form farm equipment pools, handle government-imported fertilizers, operate grain mills and perform other activities which will improve the rural economy when properly conducted.

The Suwon Cooperative Association is very active and progressive. It was started with the help of faculty members of the College of Agriculture. There are 927 farmer members of the Association. Their activities include the handling of feeds and eggs, operation of a small meat processing plant, operation of a hatchery, and a boar stud. Four Berkshire boars are maintained and by means of artificial insemination 120 services are secured from each boar per year, with a record of 86 percent conceived.

19. SUMMARY STATEMENT OF CURRENT SITUATION

The report thus far has dealt with the current situation of the College of Agriculture, Seoul National University, particularly as it relates to the field of the writer's responsibility, Animal Husbandry. Much of this material has appeared elsewhere and the writer has drawn heavily upon previous reports in addition to making personal observations and investigations. The purpose of this initial part is to lay the groundwork for understanding the activities and recommendations of the writer which follow.

II. ACTIVITIES OF THE ADVISER

1. INTRODUCTION

The writer was in Korea for a six months period, August 7, 1959 to February 5, 1960 and was stationed at the College of Agriculture at Suwon. Enroute to Korea four days were spent in Japan for the purposes of having conferences with the U.S. Agriculture Attache' and the Japanese Federal Livestock authorities. The primary purpose of the Mission to Korea was to assist in improving teaching, research and other institutional activities, particularly in the field of Animal Husbandry, at the College of Agriculture, Seoul National University. This involved, among other things: (1) Learning the fundamentals of organization and administration of Seoul National University, and particularly of the College of Agriculture. (2) Becoming acquainted with Korean colleagues and leaders in agriculture, and especially in animal husbandry. (3) Establishing appropriate liaison with technical societies or agencies. (4) Gaining first-hand information about Korea and its people, particularly in the area of specialization. (5) Becoming acquainted with the details of curriculum, courses, and teaching methods and procedures, currently in effect, noting the differences between the same and those of Western institutions and agencies, and bringing to the attention of Korean colleagues significant differences between the two, and assisting in making changes if desired. (6) Becoming acquainted with the kind, amount and quality of research, evaluating the same and assisting in improving efforts in this direction. (7) Determining the needs for buildings, facilities and equipment needed in teaching and research, and providing assistance in placing such physical elements in effective use.

The adviser has served the staff mainly in discussing instructional problems; securing subject and research materials and in advising in regard to land, buildings and equipment needs and uses. Assistance was given in several phases of the teaching program. Several talks were given to various groups, including technical societies. Many agricultural facilities were visited. Assistance was given in planning tours for visitors and in arranging conferences between visitors and staff members.

Many conferences were held with instructors from other institutions and experiment station workers. Several meetings were held with USOM personnel.

A brief report of these activities follows.

2. INSTRUCTIONAL PROBLEMS

Teaching animal husbandry in Korea is difficult because of the lack of suitable livestock and laboratory materials and text books in the Korean language. Reference material is very scarce, mimeographing is not readily available and there is practically no projection material. Consequently the lecture and note taking method is commonly used. Staff members are doing very well under existing conditions and have in many instances prepared charts for

classroom use. Also some staff members have translated English text books into Korean.

Assistance was given in securing projection slides from educational institutions in the U.S. Also, the writer left a considerable quantity of slides, charts, mimeographed notes and reports, and text books for staff members. A large quantity of hormones is to be received gratis from the Chas. Pfizer Company. These are to be used in experimental work.

Suggestions for the improvement of teaching, that have been discussed in detail with staff members, are included in the recommendations.

3. INSTITUTIONS AND ORGANIZATIONS VISITED IN KOREA

Many agricultural institutions and organizations were visited by the writer. In most instances these visits were made at the suggestion of staff members at the College and in some cases at the request of other colleges and institutions. The purpose of these trips was to gain first-hand information in regard to Korean agriculture, especially with regard to livestock production. These visits afforded an opportunity to become acquainted with leaders in agriculture and animal husbandry and also to establish contact with agencies having to do with livestock feeding, breeding, managing and marketing. At the various institutions visited the educational and research activities were investigated and buildings and equipment observed. In addition it should be pointed out that visits were made to farms in various areas.

A list of most of the places visited follows; this also includes the name or names of key personnel contacted.

Central Livestock Experiment Station, Songhwan. Director - Song Hak, Kang

Seoul Agriculture College, Seoul. President - Hi Jai, Rhee

Taejon Branch Experiment Station - Taejon. Director - Sang Chur, Kim
Assistant Director - Sae Chong Oh

Suwon Livestock Cooperative Association, Suwon. Manager - Jung In Kim

Hwason Branch Experiment Station, Suwon. Director - Hyum Chail Kim

Livestock Experiment Station, Cheju Island. Director - Ung Dal Kwon

Cheju University, Cheju City. President - Seung Won Im

National Livestock Farm, Cheju Island. Director - Chim Bok Kim

Livestock Breeding Station, Kyonggi Province, Anyang.
Director - Yong Whan No

National Veterinary Laboratory, Anyang. Director, Chang Hi Rhee

Scientific Research Institute, Ministry of National Defense, Seoul.
Director - Nack Un, Chung, Vice Director - Tai Young Lee

Seoul Packing Plants, Seoul. Visited with Nam Sin Lee, Director,
Livestock Bureau, Ministry of Agriculture and Forestry.

Seoul Cooperative Milk Plant, Seoul. Manager - Sa Ik Kim

Kyunggi High School, Seoul. Principal - Won Kyu, Kim

Kyungju Branch Experiment Station, Kyungju. Superintendent - Suk Pak

National Library, ROK, Seoul. Director - Song Phill Kim

Suwon Agriculture and Forestry High School, Suwon. Principal - Ok Sung Y

Swine Breeding Station, Suwon. Manager - In Kyu Choi

Central Agriculture Experiment Station, Suwon. Director - Yong Chirl Char

Bureau of Livestock, Ministry of Agriculture and Forestry, Seoul.
Director - Nam Sin Rhee, Section Chief - Yun Su Yun

Institute of Agriculture, Suwon. Director - Ham Kyu Chung, Director of
Experiment Bureau - Chong Rin Rhee, Director of Extension Bureau -
Jai Uk Myung.

4. TALKS OR LECTURES GIVEN IN KOREA

In cooperation with Livestock Department staff members several talks were given during the writer's stay in Korea. Most of these were illustrated with projection slides which were brought over or shipped from the U.S. by mail. Through these talks a wide acquaintance was developed with people interested in Korean agriculture. All the talks except two were interpreted; these two were given at Suwon to the College of Agriculture general faculty and the student Livestock Club. The talks covered such subjects as contrasting Korean and United States livestock production, the use of urea in livestock feeds, and similar subjects. Two lectures were given to graduate students in Animal Husbandry.

Following is a list of talks given and attendance at such meetings.

To Animal Husbandry staff members and livestock instructors from various provincial agricultural colleges, meeting at Suwon. (19)

Student Livestock Club, Seoul National University College of Agriculture. (60)

Korean Agriculture Society Meeting, Suwon. (500)

College of Veterinary Medicine, Seoul National University, Seoul. (115)

Short Course for Livestock Specialists, Suwon. (250)

Chungbuk College, Chonju. (130)

Kang Kug University, Livestock College, Seoul. (63 students and 8 staff members.)

Campus 4H Club, Seoul National University College of Agriculture. (310)

Central Agriculture Experiment Station, Songhwan. (18 staff members).

Provincial and Gun Officials, Ulson. (18)

Swine Management Training School for Community Development Personnel. Ulson. (75)

Korean Livestock Society, Seoul Milk Cooperative Association, Seoul. (55)

General faculty meeting, Seoul National University College of Agriculture. (45)

5. CONFERENCES WITH USOM AND MINISTRY OF AGRICULTURE AND FORESTRY PERSONNEL

Several conferences were held with various staff members of USOM and Ministry of Agriculture and Forestry people about features of Korean agriculture and the effect of such features on livestock production. Meetings were arranged with USOM representatives and College of Agriculture staff members which were mutually beneficial. There appears to be need for closer integration of and cooperation with difference agencies involved in the improvement of Korean agriculture. In order to more adequately feed the Korean people the level of agricultural production must be increased. Considering the present population and the probable increase in same, efficiency in agriculture is imperative to supply food requirements.

6. EQUIPMENT NEEDS OF THE LIVESTOCK DEPARTMENT

An endeavor was made to determine what additional equipment is needed in the near future and also what should be included in the future development of the department. An attempt was made to assist in bringing into proper use equipment already on hand, and to stress the proper maintenance of same. Equipment requirements are seldom if ever satisfied in a progressive teaching and research program. It is often difficult to predict what might be worthwhile additions to existing equipment. An endeavor was made to point out what items of equipment could be used effectively within the next year. Such a list appears in the appendix. It was suggested that the difference staff members submit requests through channels in order that each item be properly considered. It may be that in some cases equipment can be pooled for use of all departments in the College.

III. RECOMMENDATIONS

1. General, With Reference To The Entire College:

- (1) There is some confusion about the name of the Livestock Department since some faculty members have the title, Professor of Animal Husbandry. In keeping with the type of instruction offered and the professional standing of staff members, it is suggested that consideration be given to changing the department name to Animal Husbandry or Animal Science.
- (2) It is noted that 160 semester credits are required for graduation with a B.S. degree from the College of Agriculture. One hour credit is allowed for one hour lecture or 2 to 3 hours laboratory per week. Since the semester is about 15 weeks in length, it would seem that the graduate requirement is high in comparison with that of the University of Minnesota, which is 192 to 204 quarter credits, and Iowa State University which requires 200 quarter credits.
- (3) There are some double lecture periods included in the curriculums. Single lecture periods are preferable except for seminars, laboratories or field trips. There is a tendency to start late and stop early with double lecture periods. There appears to be laxity in the following of class schedules.
- (4) It would appear that there might be some advantage in interchanging the language courses in the common freshman year. Currently English and German are given the first semester and English and Korean are taken the second. If transposed, the students would not be exposed to two foreign languages the same and first semester. In fact it may be preferable to postpone German to the junior or senior year. It may be advisable to make more courses in English available on an elective basis and permit the substitution of such courses for German.
- (5) Graduate courses could be further identified, as are the undergraduate courses, by using 500 numbers for courses intended for graduate and qualified undergraduate students, and 600 numbers for courses limited to graduate students.
- (6) A departmental course of the technical lecture type, a survey of Animal Husbandry, could be added to the Livestock curriculum as a one hour per week, but no credit course, to acquaint new students with the general field of livestock production. Similar courses in other curriculums would serve as orientation courses to acquaint first-year students with work in a given area.
- (7) Some of the curriculums may be unbalanced in course offerings; for example, the livestock curriculum has but two required courses in Agricultural Economics. One is Economics 115, Principals of Economics,

2 credits; the other is Economics 205, Statistics, 3 credits. The latter appears to be statistical rather than economics in nature. An Economics course in Farm Management would be a worthwhile addition. The Agricultural Economics curriculum also appears somewhat lacking in Livestock courses.

- (8) It is suggested that a faculty committee, with a number from each department, be set up to study all curriculums and make recommendations for changes to the general faculty and the administration for their consideration. A well thought out curriculum for each major field could be used for two years, thereby eliminating the need for publishing a catalogue or bulletin each year. A biannual catalogue would be advantageous.
- (9) Graduates from some Western colleges have indicated need for more experience in the communication skills. In this connection it is noted that no public speaking course is included in the curriculum. This may be a worthwhile addition.
- (10) There is great need for a Department of Vocational Education in the College of Agriculture for the main purpose of training young men and women for teaching positions. Students in other fields or curriculums would profit by electing some of the basic courses in education. In the long range planning of the College there is no doubt included provision for additional departments such as Music, Physical Education, and others.
- (11) As many of the Japanese books in the library are old and not used very much, consideration should be given to placing the least used ones in dormant storage. Some of the other books are also quite old, for example the Encyclopedia Britannica examined was dated 1928. There are many new books that would be worthwhile additions to the library, and self-evident is the need for books in Home Economics and Sericulture. Books to be used for class assignment should be sufficient in numbers and reserved for student use in the library. A required library course meeting 3 or 4 one-hour periods at weekly intervals is suggested as a means of acquainting students with library facilities. Trained personnel would also add to the effective use of the library.
- (12) A system of faculty advisers in which every student in the department is assigned to a staff member for counsel and guidance would be most helpful.
- (13) It is suggested that instructors use an Instruction Rating Form for the purpose of obtaining an evaluation of their teaching, covering such items as:
 - a. Preparation and organization of material for individual classes
 - b. Use of the class hour
 - c. Clarity of assignments
 - d. Class control, etc.

A sample copy of such a form is being left with Dean Cho. Such surveys should be optional with the instructors and for their personal observation only.

2. Pertaining To The Livestock Department And Curriculum:

- (1) It may be some time away, but before long there will be a need for having separate curriculums within the Livestock Department for the three sections, Animal Husbandry, Dairy Husbandry and Poultry Husbandry. Some Western agricultural colleges also have options in their curriculums such as, Production, Business or Industry, and Science and then suggest different courses, both required and elective. It may be advantageous to consider the preparation of a special Science option for those of high scholarship, outstanding character and leadership.
- (2) In keeping the subject matter covered the title for L-202 should be changed to Livestock Selection or Improvement and the subject matter changed accordingly.
- (3) A Special Problems Course in Animal Husbandry with credit 1 to 3 is suggested for junior and senior students showing satisfactory preparation for the problems chosen. This would be limited to students ranking in the upper half of their class in grades. In this course an individual topic would be assigned to each student after conferring with the instructor involved. For each topic the preparation of a complete report would be required for credit.
- (4) There should be a decrease in emphasis in the course work in horses, hide tanning and other areas in which there becomes a lessening of application. Also, course work should be kept abreast with the changing times. It may be advantageous to make surveys of seniors at the time of graduation, and to secure their opinion on matters pertaining to curriculum.
- (5) Teaching aids are quite lacking in the Livestock Department. Many of the requested equipment items are included in the appendix. These will add interest to teaching, and in many ways add to the thoroughness of research endeavors. The need for text books and other reproduced material is quite apparent.
- (6) The teaching of livestock production courses would be more impressive if some of the kind of livestock involved could be fed and managed by the students. This could be accomplished in a swine production course by feeding two lots of pigs, one lot with a modern ration and the other with an old-fashioned ration. Similar comparisons could be made with poultry, sheep and cattle.
- (7) Consideration has been given to Food Technology as well as Dairy Industry. One of the staff members in the Livestock Department includes in his teaching and research activities the industry aspects

of milk and milk products, particularly the processing, packaging, quality and sanitary control, and marketing of milk and milk products.

A member of the Chemistry Department has had some training in food technology and a staff member of the livestock Department is presently enrolled at the University of Minnesota and is being trained in part on food technological aspects of meat and animal production. Certain as industry is developed and urban population increases there will be greater need for experts in the field. This includes the science and engineering of manufacture, transportation, storage, distribution and utilization of food.

Cooperation is imperative for maximum progress in this area. Included in this cooperation should be the various departments of the College having to do with food, as well as the Institute of Agriculture.

It is conceivable that cooperative canning plants, such as the government subsidized ones in the United States, might prove advantageous in converting perishable products into storable forms, thereby spreading out food supplies.

- (8) The problems of when, where, and how to market livestock are continually confronting the producer. This involves the reflection of consumers' wants to the actual producer as well as a knowledge of the marketing involved. Acceptable products made available to the consumer by an efficient marketing system, and at a reasonable cost, should be the major objective of a marketing system. Korean eggs, for example, are of high quality and extremely well marketed. An example of the lack of quality is the marketing of uncastrated meat animals. Castration at an early age would also improve tractability and the efficiency of feed conversion.
- (9) The need for a closer working relationship between the College of Veterinary Medicine and the College of Agriculture of Seoul National University is quite apparent. Two livestock instructors do part-time teaching at the College of Veterinary Medicine, and there is no staff member in the Livestock Department who can adequately teach Veterinary Anatomy, Physiology and Hygiene to the Agriculture students. The relocation of the Veterinary College at Suwon near the Institute of Agriculture and College of Agriculture would be advantageous to all concerned.
- (10) Projects suitable for graduate students will not be numerous with the limited livestock facilities available. Use of the facilities at the Hwasan Branch Livestock Experiment Station and the Kyonggi Province Livestock Breeding Station and other similar installations should be encouraged. Likewise, the Suwon Cooperative and the local slaughter plant could provide suitable material for students. Consideration should be given to problems which have a direct application of findings,

such as the relation of heart-girth measurements to the weight of Korean cattle.

- (11) If land adjacent to the present livestock area is not available for the necessary livestock numbers, it is suggested that in the long range planning, consideration be given to the acquisition of the Hwasan Branch Station which could serve more than one department.

3. General With Regard To Korean Livestock:

- (1) The trend toward mechanization of agricultural practices is clearly indicated by the recent increase in power-driven machines in Korea. There has been a marked increase in power-driven machines like threshing machines, hullers, sprayers, etc. No doubt this trend will influence livestock production, with an inevitable decrease in numbers of draft-type livestock on highways and city streets. Animals used for tractive purposes on country roads will be replaced as such roads are improved. The native cattle used in the fields or paddies will not be replaced in sizable numbers for some time. Considering the small fields or paddies and the adaptability of the native cattle to such duties as plowing, and the skill of Korean farmers in handling the cattle, would indicate that this replacement will be very slow. Also, any replacement by livestock will be tempered by available capital and skillful operators of power implement sources. Since the native cattle are essentially dual purpose, that is both meat and work sources, and considering the probability of lessened use for the latter, it may be advantageous to explore the possible improvement of the meat qualities.
- (2) The introduction of livestock from other countries should be on a limited scale, and only disease-free, production-tested animals should be imported. Imported animals should be kept in quarantine until they are free from communicable diseases. Before any existing stock is discarded it should be evaluated by being production tested, both the straight breeds and incrosses. For example, black native pigs should not be discarded until they are thoroughly tested.
- (3) The limited supply of livestock feeds will be one of the difficulties to overcome in expanding Korean livestock production. As feed grains become available livestock will increase. This will be a major problem involving the agronomist and other areas of agriculture specialization. The same applies to forage and pasture crops. The improvement or discovery of plants that will flourish on the now rather barren hillsides is a challenging problem for the plant scientists.
- (4) As the feed industry is expanded feed laws will be in order to protect the honest feed manufacturer and dealer as well as the livestock producer.
- (5) A study should be made of the meat producing efficiency of the Korean black goat. Where goats are indicated it may be that larger or milk goats will be more efficient in converting the available feed into human food. It is possible, too, that the use of sheep would be the answer to some situations.

- (6) When grain or grain by-products become more generous in supply and larger feeding units are established, full feeding should be encouraged with the result that the feeding period for meat animals will be shortened and the feed conversion made more efficient. Most Korean pigs are comparatively old (12 to 14 months) when slaughtered; this would be efficient when by-products, such as garbage, form the major part of the ration.

IV. APPENDIX

1. Agricultural College In Korea

<u>Location</u>	<u>Name of College</u>	<u>Departments</u>	<u>Private, National or Provincial</u>
Suwon	College of Agriculture Seoul National University	Agriculture, Forestry, Livestock, Agr. Chemistry, Agr. Engineering, Agr. Biology, Sericulture, Agr. Home Economics	National
Iri	Agriculture College Chonbuk University	Agr. Chemistry, Agriculture, Forestry. Vet. Medicine	National
Kwangju	Agriculture College Chonnam University	Agriculture, Forestry, Veterinary Medicine	National
Taegu	Agriculture College Kyongbuk University	Agriculture, Agr. Chem- istry, Horticulture, Veterinary Medicine	National
Chunchon	Chunchon Agriculture College	Agriculture, Livestock, Forestry. Agr. Chemistry	National
Taejon	Agriculture College Chungnam University	Agriculture, Agr. Engineer- ing, Livestock, Agr. Manu- facturing	Provincial
Chinju	Chinju Agriculture College	Agriculture, Forestry, Livestock, Vet. Medicine	Provincial
Chongju	Chungbuk College	Agriculture, Forestry, Livestock	Provincial
Cheju	Cheju College	Agriculture, Vet. Medicine, Livestock	Provincial
Seoul	Seoul Agriculture College	Agr. Engineering, Horti- culture, Farm Management, Veterinary Medicine	Municipal
Seoul	Agriculture College Korea University	Agriculture, Forestry Veterinary Medicine	Private
Seoul	Agriculture College Tongkuk University	Agriculture, Forestry	Private

<u>Location</u>	<u>Name of College</u>	<u>Departments</u>	<u>Private, National or Provincial</u>
Seoul	Livestock College Keonkuk University	Livestock, Livestock Processing	Private
Pusan	Agriculture College Tongah University	Agriculture, Agr. Engineer- ing, Horticulture	Private

2. Livestock Experiment Station In Korea

--Central Livestock Experiment Station, Sungwhan	
--Livestock Section	- Improvement of livestock and poultry. Production of seed stock.
--Livestock Chemistry Section	- Analysis of feeds and livestock-products.
--Management Section	- Improvement of pasture and forage crops. Utilization of livestock power. processing of livestock-products
--General Affairs Section	
--Kyungju Branch Experiment Station	
--Whasan Branch Experiment Station	- Goats and honey bees
--Taikwanryong Branch Experiment Station	- Korean native cattle, rabbits and forage crops
--Taejon Branch Experiment Station	- Sheep, cattle, and range improvement
--Sachon Branch Experiment Station	- Chickens
--Cheju Branch Experiment Station	- Swine
	- Beef cattle, horse and range improvement.

3. List of Additional Equipment Requested by The Department of Livestock
College of Agriculture, Seoul National University

<u>Item No.</u>	<u>Quantity</u>	<u>Item</u>	<u>Co. and Address</u>	<u>Cat. No.</u>	<u>Unit price</u>	<u>Total price</u>
1.	1	Veseler projector Vu - Lite No. 3008	Charles Beseler Co. 219 S. 18th Street East Orange, New Jersey		\$294.00	\$294.00
2.	1	Lean meter, high frequency Sound wave	Duncan Electric Mfg. Co. Lafayette, Indiana		82.00	82.00
3.	5	Pig embryo slides typ.x.s. of 10 mm stage	Jurtox Biological Supply Co. 8200 S. Hoyne Ave., Chicago	17 E 771	2.00	10.00
4.	3	Chick embryo slides Whole mount of 48-hour stage	"	16 E 6	2.20	6.60
5.	2	Chick embryo slides 48 hr. typ. x. Secs. through 3 regions	"	16 E 63	2.20	4.40
6.	5	Wheelbarrow	NASCO, Fort Atkinson Wisconsin	0620-FE 8512	32.25	161.25
7.	1	Typewriter	Sears Roebuck Co. Los Angeles 54, Calif.	3Y07767L	164.00	164.00
8.	2	Soxlehet extraction apparatus	Shoar (catalogue)	F 1080	40.00	80.00
9.	1	Chick electric battery brooder, 4 decks with truck	H.D. Hudson Mfg. Co. Chicago, Ill.		100.00	100.00
10.	1	Chick growing brooder, 4 decks with truck	"		60.00	60.00
11.	1	Incubator fumigant	Val-A Co., 700-710 W. Root St., Chicago 9. Ill.	567	7.50	7.50

<u>Item No.</u>	<u>Quantity</u>	<u>Item</u>	<u>Co. and Address</u>	<u>Cat. No.</u>	<u>Unit price</u>	<u>Total price</u>
12.	1	Chicken Tee	Val-A. Co., 700-710 W. Root St., Chicago 9, Ill.	567	5.00	5.00
13.	10	Cyclone electric fountain	"	305 EA	10.75	10.75
14.	2	Cyclone intra red	"	RE 3 G	8.90	17.80
15.	1	Automatic electric heater	"	15050	6.45	6.45
16.	1	Protection rotating	"		57.50	57.50
17.	5	Gooch Crucible	Fisher Scientific Co. 635 Greenwich N.Y. 14, N. Y.	8-234	3.50	17.50
18.	1	Laboratory crusher	"	8-290	150.00	150.00
19.	1	Hanson stock weigher	NASCO	Z 1037	89.95	89.95
20.	1	Batch mixer, Model 7202	Cole-Former Instrument & Equipment Co. 224 W. Illinois St., Chicago 10, Ill.		1,165.00	1,165.00
21.	1	7220 BOWL, 50 qt.	"		114.00	114.00
22.	1	7222 Beater, 30 qt.	"		68.00	68.00
23.	1	Hay baler	No information available		300.00	300.00
24.	1000 lbs.	Feed (Vit-Mixture)	"			
25.	1	Chopper (for meat processing)	"			
26.	1	Airforced dry oven (for feces drying)	"			

<u>Item No.</u>	<u>Quantity</u>	<u>Item</u>	<u>Co. and Address</u>	<u>Cat.No.</u>	<u>Unit price</u>	<u>Total price</u>
27.	1	Oven for feed analysis	No information available			
28.	1	Rotary pump	"			
29.		Rat poison	"			
30.	1	Generator (10 K, 60 cycle A.M.)	"			
31.	1	Toledo balance (2000 grams)	"			
32.	1	Planimeter	"			

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