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This is to certify that we the undersigned, as a committee of the Graduate School, have given Sherman Dickinson final oral examination for the degree of Master of Arts . We recommend that the degree of Master of Arts be conferred upon the candidate.

Minneapolis, Minnesota

May 24, 1930.

A. M. Field

Chairman

O. H. Eckles

Albert W. Rankin

THE UNIVERSITY OF MINNESOTA

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Report
of
Committee on Thesis

The undersigned, acting as a Committee of the Graduate School, have read the accompanying thesis submitted by Sherman Dickinson for the degree of Master of Arts.

They approve it as a thesis meeting the requirements of the Graduate School of the University of Minnesota, and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Arts.

G. M. Field

Chairman

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Albert W. Rankin

May 24 1920.

ANIMAL HUSBANDRY IN MINNESOTA HIGH SCHOOLS

**A Thesis Submitted to the
Faculty of the Graduate School of the
University of Minnesota**

by

Sherman Dickinson

**In Partial Fulfillment of the Requirements
for the Degree of
Master of Arts**

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TABLE OF CONTENTS

Part I Introduction Page 1 -

Part II Tables and Interpretations Page 8 -

Part III Discussion and Conclusions Page 92 -

Part IV Appendix Page 102 -

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ANIMAL HUSBANDRY IN MINNESOTA HIGH SCHOOLS

PART I

INTRODUCTION

Reasons for Investigation

Importance of Animal Husbandry

Livestock, as an economic factor in the affairs of the human race, is of the utmost importance. Wherever man has reached his highest plane of development, domestic animals are found in greatest abundance. The savage tribesman of Central Africa knows little or nothing of the value of tamed animals but depends upon the chase for his supply of food and clothing. His existence is precarious. With the growth of civilization we find a parallel growth in the number and character of the domestic animals.

The livestock on the farms of the State of Minnesota was valued in 1919 at \$342,954,000.* This amount is made up as indicated in the following table.

Numbers and Farm Values of Minnesota Livestock in 1919"

	<u>Number</u>	<u>Value</u>
Horses	956,000	\$93,760,000
Milk Cows	1,368,000	\$106,704,000
Other Cattle	1,632,000	\$54,672,000
Sheep	642,000	\$8,474,000
Swine	2,784,000	<u>\$79,344,000</u>
Total		\$342,954,000

*This does not include poultry, which would add a large sum. No accurate figures are available for this item.

"Report of Minnesota Field Agent, Bureau of Crop Estimates, U.S.D.A., 'Minnesota Livestock, 1919-1920'".

This is a greater money value than the combined values of three of Minnesota's greatest crops. On Dec. 1 1918 wheat was valued at \$162,608,000, corn at \$122,000,000 and potatoes at \$24,570,000, a total of \$309,278,000.* This is \$33,676,000 less than the value of the livestock.

In addition to the cost value of these animals, it must not be forgotten that health and happiness are absolutely dependent upon their presence. Meat, dairy and poultry products are essential for sturdy growth of children and the maintenance of vigor in adults. It has often been said that the meat eating nations rule the world. Shoes and woolen clothing must be had and the labor of horses is necessary in most lines of production.

As another indication of the value of livestock, it is noticeable that successful crop production is not often maintained for many years without livestock to assist in the upkeep of fertility. It has been demonstrated many times that exclusive grain farming, even with rotation, is quite apt to deplete the soil of organic matter and fertility. A case in point is the farming in the Dakotas. The agriculture most successful over a long period is that in which the plants raised are fed to farm animals and the manure returned to the soil. In the early days in Dakota farming, grain alone was grown year after year, but now much stock is raised.

Importance of Teaching Animal Husbandry

During the period since the Civil War, great progress has been made as regards our knowledge of farming. This has been particularly true with livestock. Knowledge of breeding, feeding and disease prevention and cure has been rapidly acquired and with

*1918 Year Book--U.S. Department of Agriculture.

the coming of the Agricultural Colleges and Experiment Stations, has been given a systematic and thorough testing.

In the early days of farming it was a comparatively simple matter to make a living with livestock. Soon, however, as this scientific information became available, those men who came in contact with it began to lead the others. Competition grew stronger. Raising a hog or fattening a steer became more than a mere rule of thumb procedure. Farmers are now beginning to talk of heredity, energy, protein, pedigrees, vaccines and numerous other matters which a few years before were rarely mentioned in connection with Animal Husbandry. This information, where it has been disseminated, has resulted in increased and more economical production.

The first means used to get this valuable information to the people was the Agricultural College. Here young men of 18 years of age or more were taught the most up to date methods of livestock breeding, feeding and care. But this was not enough. Farm animals were of such importance that waiting for the people to come to the college was too slow. As a consequence, the college went to the people through the Extension Service. But of recent years, this has not been enough. Finally Agriculture was put into the high schools, in some states with help from the State and in all now, with Federal Aid under the Act known as the Smith-Hughes Law.

Animal Husbandry is one of the most important of the subjects offered in these high school courses. As has been stated

in the opening paragraphs, its importance to the state agriculturally and economically is far in excess of the cash valuation. Whatever knowledge is of most worth should be available to the boys of the high schools who are to be our future farmers. That this knowledge may be presented in the best possible manner is the object of this study.

Difficulties Encountered in Teaching Animal Husbandry

In teaching Animal Husbandry in the schools of Minnesota there are many difficulties encountered. In the early days, and even at the present time there is much speculation as to just what is the right thing to do. How much technical material should be taught to these boys, should text books be used and what ones, in what order should the subjects be presented, how much time should be given to each topic? These are only a few of the questions which arise.

In many communities there is found a conservatism as regards ways of doing things that seems to defy all effort to break it down. Lack of funds with which to purchase needed equipment and supplies is often associated with this condition, but the attitude of the people is the more discouraging factor. Lack of sympathy and understanding for the work on the part of administrators and fellow teachers is a difficulty too often present. This investigation has been made with the idea in mind that the information gathered will be of help, at least in a general way, in overcoming these difficulties.

Seeming Lack of Uniformity

Throughout the State there has been a seeming lack of uniformity in certain matters pertaining to Animal Husbandry

teaching. This ununiformity is not so noticeable now as some years ago, when, in the subject of Field Crops one man devoted thirty weeks to corn and another man only one week. It is not intended to convey the idea that there should be complete uniformity. This would be undesirable in a state the size of Minnesota and with such diverse agricultural interests. There should, however, be a "best way" of teaching, and teachers in similar communities should have similar practices.

As noted above there is more uniformity now than ten or five years ago. This is due to the teachers themselves, meeting in conference; to the efforts of the Division of Agricultural Education of the College of Agriculture and to the State Department of Education. It is generally thought however, that there is room for improvement in this matter.

Limitations of Thesis

This thesis will be limited to a study of the six and nine months courses* in Animal Husbandry as offered in the high schools of Minnesota. This excludes the study of Animal Husbandry, (1) as it may appear as a part of a general Agricultural course which is sometimes given in the first year of high school; (2) as it may be offered as a part of the Normal Training course; or (3) as it may be offered in a Short Course.

Animal Husbandry may be defined as "that subject which deals with the classification, breeding, feeding, care and management of the common farm animals".[‡]

*Deephaven, with a 4 1/2 months course is the only exception.
[‡]Bees are usually studied, if at all, in the Animal Husbandry course. They are sometimes given place in the Horticultural course.

The study is further limited to (1) the Content of the course; the Time allotted to each subdivision of the content; (3) the physical Equipment for instruction and (4) to such other portions of the process of Animal Husbandry presentation as may serve to illuminate as complete a comprehensive study of (1), (2), and (3). Methods of teaching, as such, will not be investigated, and will not be discussed except as they may appear in (4).

By Content of the course is meant the various topics and subtopics treated. Time allotment is figured on the basis of days. This is practically the same as periods of recitation or laboratory, counting two laboratory periods the equivalent of one in recitation. Equipment refers to all material, illustrative or laboratory, which is used in teaching Animal Husbandry.

Two Classes of Schools

Schools receiving aid under the Smith Hughes Law of 1917 are expected to offer courses that are strictly vocational. In gathering and recording data for this thesis, these schools have been kept separate from the others. They are designated in the following pages as Smith - Hughes schools, those not receiving aid under this act, as non - Smith - Hughes. In this way a comparison may be made on several bases to note the effect of the Smith - Hughes bill on the courses in Animal Husbandry.

What the Thesis will Attempt

The thesis will attempt to accomplish in general, three things: (A) show the present character of Animal Husbandry in Minnesota high schools; (B) point out desirable and undesirable conditions and (C) offer a sound, constructive program of procedure regarding content, time allotment and equipment in teaching this

subject in Minnesota.

This investigation was made through the use of a questionnaire sent to all high schools in the state where a department of agriculture is maintained. Answers have been received from the greater number of these schools and in the majority of cases, these answers are complete and usable. As may be seen by consulting the map on page 32 every part of the state is well represented. The questions were of five general types as follows: general questions, questions on content, on time allotment, on equipment and on value of Animal Husbandry teaching. A copy of the questionnaire will be found in Part IV.

This material has been carefully compiled and made up into tables found in Part II. Where figures were illegible or where there was doubt as to the accuracy of an item, the questionnaire was either sent back for correction or not used in making up the figure.

An attempt was made to gather data relative to the results of Animal Husbandry teaching. The value of this work could be measured by its results, provided definite data could be secured indicating these results. Questions 201, 202, and 203 were asked with this purpose in mind. If the course was successful more boys would remain on the farms permanently, these boys would become successful livestock breeders and the livestock of the community would be improved.

It was difficult to get any definite replies on this question. It was impossible to follow up the boys and even could this have been done, so many other factors enter into their lives that it would be hard to trace any change directly to the Animal Husbandry teaching.

PART II

TABLES AND INTERPRETATIONS

This section of the Thesis will be taken up with various tables compiled from data received in answer to the Questionnaires sent out. An effort has been made to simplify the material so that the real facts will not be covered up in a mass of detail. Where there is an opposition between Smith-Hughes and non-Smith-Hughes schools, the figures will be shown in separate tables. Tables lettered (a) are based on reports from Smith-Hughes schools, those lettered (b) are from non-Smith-Hughes schools.

Each table will be followed, where necessary, by a short discussion of especially important matters brought out by the figures. To assist in the study, the totals have been figured and the averages, medians, modes and range have been worked out.

Some tables will be found where the names of several schools are lacking. This is due to the fact that in some instances schools were unable to answer the questions asked. Where schools did not put down time allotments, as with bees, they were omitted from the tables and the averages are made up on the basis of those reporting.

One hundred and eight questionnaires were sent out, this being the number of agricultural departments in the state. In some cases the instructors had never taught Animal Husbandry so could not reply fully. Usable answers were received covering the work in 27 Smith - Hughes schools and in 41 Non - Smith - Hughes schools. One of the Smith - Hughes schools offers both 6 and 9 months courses and answers were received for two different years in two Non - Smith - Hughes schools.

TABLE # I (a)

A List of the Schools Having Animal Husbandry Courses,
Together with some General Information relating to the same.

School	Weeks in Course	Year 19-	Instructor
Albert Lea	24	19-20	L. H. Thurwachter
Alexandria	24	19-20	K. A. Noosen
Blue Earth	24	19-20	Benj. Brickman
Cannon Falls	24	19-20	C. A. Partridge
Chatfield	36	19-20	H. M. Hamlin
Cokato	24	19-20	J. W. Kauffman
Deer River	36	19-20	E. Y. Shaad
Fairmont	24	19-20	Paul Calron
Fosston	36	19-20	J. R. Hewitt
Grand Rapids	24	19-20	A. H. Frick
Hector	36	19-20	Geo. Girsbach
Jackson	36	18-20	P. M. Hewitt
Kasson	36	19-19	J. C. Hening
Madelia	24	19-20	E. N. Johnson
Mantorville	24	19-20	S. A. Aldrich

School	Weeks in Course	Year 19-	Instructor
Montevideo	36	19-20	J. H. Lefforge
New Richland	24	19-20	F. L. Crowe
Norwood Y. A.	36	19-20	M. W. Knoblauch
Owatonna	24	19-20	H. W. Hartle
Park Rapids	36	19-20	H. A. Pflughoeft
Pipestone	24	19-20	V. A. Edwards
Renville	36	19-20	Willgert Reiley
Sandstone	36	19-20	H. H. Amos
Sauk Center	24	18-20	E. M. Gillig
Thief River Falls	36	19-20	F. A. Tripp
Thief River Falls	24	19-20	F. A. Tripp
Virginia	24	19-20	O. A. Stangel
Waseca	24	19-20	D. F. Adams

The above towns represent the various parts of the state very well. From Albert Lea and Jackson in the south to Thief River Falls, Deer River and Virginia in the north, the field is well covered.

Sixteen of the towns reported courses of 24 weeks, the balance twelve, reported 36 weeks. There is not enough variation here to lead to definite conclusions.

It will be noticed in the column headed "Year", that the most of the answers are based on the current year's practice. This probably means that the figures given for time allotment in fall and winter are based on actual practice, and those given for spring work are based on plans for the balance of the year. As but few men keep accurate records from year to year, the recency

of the figures is of importance.

It is interesting to note that Thief River Falls offers both a six and a nine months course in vocational Animal Husbandry. It will be well to keep this in mind to discover what the differences may be between the two.

TABLE #1 (b)

School	Weeks in Course	Year 19-	Instructor
Aitkin	36	19-20	L. W. Dahms
Appleton	36	19-20	L. L. Colby
Austin	36	18-19	W. O. Lutz
Bagley	36	19-20	James Sazama
Blackduck	36	19-20	S. T. Dexter
Barnum	36	19-20	John Meissner
Brewster	12	18-19	R. E. Hubbard
Deephaven	18	17-18	Ira Montgomery
Elbow Lake	36	19-20	E. A. Oman
Eveleth	36	18-19	C. S. Faunce
Faribault	36	19-20	R. A. Brown
Fisher	36	19-20	T. W. A. Thorson
Glyndon	36	19-20	F. L. Behling
Granite Falls	36	19-20	T. G. Spring
Harmony	36	17-18	K. K. Poehler
Hill City	36	19-20	C. L. Yule
Hinckley	36	18-19	A. M. Jacobson
Howard Lake	36	18-19	Carlyle Campbell
Hutchinson	36	19-20	F. H. Turner
International Falls	36	19-20	C. A. Anderson

School	Weeks in Course	Year 19-	Instructor
Lanesboro	36	19-20	Benjamin Hofstad
Le Sueur	36	19-20	E. R. Clark
Mankato	36	17-18	Y. A. Strobel
McIntosh	36	19-20	P. O. Johnson
Medford	36	17-18	Wilbur Drake
Melrose	36	19-20	R. S. Smith
Milaca	36	19-20	Le Roy Uptagraft
Montgomery	36	17-18	D. C. Dvoracek
Morgan	36	19-20	H. M. Price
Northfield	36	19-20	Blanche A. Corwin
Pequot	36	19-20	R. S. Doherty
Preston	36	19-20	F. R. Adams
Red Wing	36	17-18	Paul E. Derby
Red Wing	36	19-20	H. G. Diepenbrack
Round Lake	36	19-20	M. F. Carr
St. Cloud	36	18-20	A. E. Whiteside
South St. Paul	36	17-18	A. J. Souba
South St. Paul	36	19-20	F. A. Tibbetts
Two Harbors	36	19-20	E. D. Ayers
Wadena	36	19-20	A. D. Becker
Warren	36	19-20	H. J. Hookom
Walker	36	19-20	F. S. Konigsmark
Westbrook	18	19-20	J. B. Wright

Of the forty-three reporting all but three schools give thirty-six weeks to Animal Husbandry. Deephaven and Westbrook each offer eighteen weeks and Brewster but twelve. It is quite plain, however, that in the non-Smith - Hughes schools this course fits in with the regular schedule of college preparatory courses.

In the case of South St. Paul, there are reports of two years each by a different instructor. It will be interesting to note variations here.

There is a greater range in dates upon which the answers are based, these running from 1917-18 to 1919-20. It may be possible to make some comparisons here, particularly with regard to equipment.

In the column headed "Instructor" there is found the name of one woman. This is unusual, but may become more and more common as time goes on.

TABLE #2 (a)

The Place of Animal Husbandry in the Agricultural Course as Compared with other Subjects Offered.

(The figures are the sum of the number of schools offering the subject during the year indicated at the head of the column)

Subjects	Years in which course is offered.			
	Freshman	Sophomore	Junior	Senior
Field Crops	<u>25</u>	3		
Animal Husbandry	1	<u>22</u>	4	
Soils	6	1	5	
Horticulture	1	6	8	1
Agr. Engineering	6	2	4	3
Farm Management		2	5	<u>8</u>
Farm Surveying				1
Rural Sociology				1
Farm Law			1	
Farm Plant Life	1			
Dairying		1	1	
General Agriculture	1			

It is quite clear that the general practice is to place Animal Husbandry in the second year of the course. In the majority of cases, it follows Field Crops. It usually precedes a study of soils, horticulture, agricultural engineering and farm management. It is often customary, where classes are small to rotate Animal Husbandry and Field Crops, teaching but one each year.

TABLE #2 (b)

Subjects	Years in which course is offered.			
	Freshman	Sophomore	Junior	Senior
Field Crops	<u>33</u>	7	1	1
Animal Husbandry	3	<u>30</u>	7	1
Soils	2	1	<u>12</u>	4
Horticulture	3	4	<u>9</u>	3
Agr. Engineering		2	5	<u>13</u>
Farm Management		2	5	<u>14</u>
Dairying			1	1
Botany	1			

It seems to be the usual practice in the Hon - Smith - Hughes school to place Animal Husbandry in the Sophomore year, preceded by Field Crops. There is seldom a good reason why it should not be presented until the Junior or Senior year, as shown in two cases in the chart. Because of its value it should appear early in the course so that if the boy is forced to leave, he will have had this study. The figures underlined indicate clearly the years in which the six main subjects of an Agricultural course are treated.

TABLE #3 (a)

Estimate of the Importance of Various Types of
Live Stock in the Local Communities.

(Made by the Instructor)

(The figures refer to the relative importance
of each class of stock in the locality)

School	Horses	Beef Cattle	Swine	Sheep	Dairy Cattle	Poultry	Bees
Albert Lea	4	3	2	6	1	5	7
Alexandria	3	2	2	3	1	2	-
Blue Earth	3	1	2	5	4	6	7
Cannon Falls	3	2	4	5	1	6	-
Chatfield	5	3	1	6	2	4	7
Cokato	1	5	3	7	4	2	6
Deer River	5	-	3	4	1	2	-
Fairmont	5	2	1	6	4	3	7
Fosston	3	4	2	6	1	5	7
Grand Rapids	4	-	5	3	1	2	-
Hector	5	4	1	-	3	2	6
Jackson	4	3	1	6	2	5	7
Kasson	6	5	2	3	1	4	-
Madelia	5	1	2	3	4	6	7
Mantorville	4	-	2	-	1	3	-
Montevideo	4	2	1	6	3	5	7
New Richland	3	4	2	6	1	5	7
Norwood Y. A.	4	5	1	-	2	3	6
Owatonna	4	5	2	6	1	3	7

School	Horses	Beef Cattle	Swine	Sheep	Dairy Cattle	Poultry	Bees
Park Rapids	5	6	3	2	1	4	7
Pipestone	5	2	1	4	6	3	7
Renville	5	2	1	-	3	4	6
Sandstone	6	7	5	3	1	2	4
Sauk Center	4	3	2	6	1	5	7
Thief River Falls 36	2	5	6	4	1	3	-
Thief River Falls 24	2	5	6	4	1	3	-
Virginia	2	6	5	4	1	3	7
Waseca	3	4	1	6	2	5	7

This question was asked so that a comparison might be made between the amount of time spent in discussion of any given class of stock and its value in the community. Schools should in most cases emphasize in their teaching, those things of greatest value in the district served. Exception to this is found where new crops or ideas should be introduced. For example, more time should be spent on Sheep in Northern Minnesota than the value of Sheep now there would seem to indicate. This is because most authorities agree that sheep raising is a coming industry in that section.

This table and Table #3 (b) should be studied in connection with the map on page 22 and with Tables # 5 (a) and 5 (b).

TABLE #3 (b)

School	Horses	Beef Cattle	Swine	Sheep	Dairy Cattle	Poultry	Bees
Aitkin	5	2	3	4	1	6	7
Austin	5	3	2	4	1	6	7
Bagley	4	2	5	3	1	6	7
Blackduck	3	2	6	5	1	4	-
Barnum	3	4	5	6	1	2	7
Brewster	4	1	2	5	3	6	7
Deephaven	-	-	4	-	3	1	2
Elbow Lake	4	1	2	6	3	5	7
Eveleth	-	-	4	2	1	3	-
Fairbault	1	4	2	7	3	5	6
Fisher	2	1	3	6	4	5	7
Glyndon	6	3	2	4	1	5	7
Granite Falls	4	2	1	5	3	6	7
Harmony	3	1	2	6	5	4	7
Hill City	5	-	2	3	1	4	-
Hinokley	2	6	5	3	1	4	-
Howard Lake	4	3	1	6	2	5	7
Hutchinson	5	3	2	4	1	6	7
International Falls	4	-	3	6	1	2	5
Lanesboro	4	2	1	6	3	5	7
Le Sueur	6	3	1	5	2	4	7
Mankato	4	3	2	6	1	5	7
McIntosh	5	3	2	6	1	4	7
Medford	3	4	2	6	1	5	7

School	Horses	Beef Cattle	Swine	Sheep	Dairy Cattle	Poultry	Bees
Milaca	2	3	6	7	1	4	5
Montgomery	4	2	3	6	1	5	7
Morgan	3	2	1	7	4	5	6
Northfield	4	2	3	5	1	6	7
Pequot	2	6	3	4	1	5	7
Preston	5	1	2	6	3	4	7
Redwing	3	5	2	7	1	4	6
Round Lake	4	1	3	-	2	-	-
St. Cloud	3	1	2	6	5	4	7
South St. Paul 17-18	1	3	2	5	4	6	7
South St. Paul 19-20	4	1	2	3	5	6	7
Two Harbors	-	-	-	2	1	3	-
Wadena	4	3	1	6	2	5	7
Warren	1	2	4	5	3	6	7
Walker	7	6	5	3	1	2	4
Westbrook	4	2	1	6	3	5	7

This table is similar to #3 (a) and requires no further explanation. Study in connection with the map.

TABLE #4 (a)

The Order of Presentation of the Main Subjects in the
Animal Husbandry Course

School	Horses	Beef Cattle	Dairy Cattle	Swine	Sheep	Poultry	Feeds & Feeding	Breeding	Veterinary.	Bees
Albert Lea	4	2	1	3	5	6	7	8	-	-
Alexandria	5	6	7	3	4	1	2	8	9	-
Blue Earth	5	4	6	3	7	1	2	-	-	-
Cannon Falls	1	4	2	5	6	7	3	8	-	-
Chatfield	7	3	1	2	5	6	4	-	-	8
Cokato	4	5	6	2	3	7	-	-	-	7
Deer River	5	4	1	6	8	7	2	3	-	9
Fairmont	6	7	8	3	5	1	2	4	-	-
Fosston	4	5	6	2	3	7	1	8	9	10
Grand Rapids	7	5	6	3	9	1	2	4	8	10
Hector	6	4	5	3	9	1	2	8	-	7
Jackson	1	5	3	2	7	4	-	-	-	6
Kasson	6	3	1	4	5	7	2	8	9	-
Madelia	1	2	3	4	5	6	8	-	-	7
Mantorville	7	6	1	4	5	8	3	2	9	-
Montevideo	4	6	5	1	7	3	2	-	-	-
New Richland	6	5	4	3	8	1	2	7	9	-
Norwood Y. A.	6	5	4	3	7	1	2	8	-	9
Owatonna	6	5	1	2	4	3	1	1	-	-
Park Rapids	4	6	5	2	3	1	-	-	-	7

School	Horses	Beef Cattle	Dairy Cattle	Swine	Sheep	Poultry	Feeds & Feeding	Breeding	Veterinary	Bees
Pipestone	5	7	8	2	4	1	3	6	-	9
Renville	6	7	8	5	4	1	2	3	-	9
Sandstone	8	10	2	9	3	1	6	5	4	7
Thief River Falls 36	6	7	8	3	4	1	2	5	-	-
Thief River Falls 24	6	7	8	3	4	1	2	5	-	-
Virginia	1	3	2	4	5	6	7	8	9	-
Waseca	2	3	6	1	4	5	-	-	7	-

SUMMARY TABLE #4 (a)

Main Subjects	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Horses	4	1	-	5	4	8	3	1	-	-
Beef Cattle	-	2	4	4	6	4	4	-	-	1
Dairy Cattle	6	3	2	2	3	4	1	4	-	-
Swine	2	7	9	4	2	1	-	-	1	-
Sheep	-	-	4	6	7	1	4	2	2	-
Poultry	<u>13</u>	-	2	1	1	4	4	1	-	-
Feeds & Feeding	2	<u>12</u>	3	1	-	1	2	1	-	-
Breeding	1	1	2	2	2	1	1	8	-	-
Veterinary	-	-	-	1	-	-	-	1	6	-
Bees	-	-	-	-	-	1	6	1	4	2

The order of presentation is not as clearly defined in the Smith - Hughes schools as in the Non - Smith - Hughes. (See Summary Table #4 b). This is probably due to project work. If the majority of the class is taking a dairy project, the instruction may start with dairy cattle study, so that the topic may be enlarged and worked on throughout the year.

Poultry shows up strongly as a beginning topic. In most cases where poultry is offered first, it is followed by General Feeds and Feeding. The poultry work is used as a basis for the discussion of feeds, digestion and growth. The most common order as discovered by the table above is as follows: Poultry, Feeds and Feeding, Swine, Dairy Cattle, Sheep, Beef Cattle, Horses, Breeding, Bees and Veterinary.

The reason that Veterinary does not count stronger in the table is that many schools treat this subject as a part of each breed. Ordinarily this subject is taken up preceding Bees. The treatment of Bees appears most often during the end of the course, possibly indicating that it may be taught only as time is found for it. It does not seem that seasonal sequence has much to do with the sequence of subjects. It is not just clear why Horses is taken up so late in the course. In the Non - Smith - Hughes schools (Summary Table #4 b) it appears first in twenty-three cases. It is quite clear from the pedagogical standpoint that either Horses or Poultry should be treated first.

TABLE #4 (b)

The Order of Presentation of the Main Subjects of the
Animal Husbandry Course

School	Horses	Beef Cattle	Dairy Cattle	Swine	Sheep	Poultry	Feeds & Feeding	Breeding	Veterinary	Bees
Aitkin	6	1	2	3	4	5	7	8	9	10
Appleton	3	2	1	6	-	5	4	7	8	-
Austin	1	2	3	5	4	6	-	-	-	-
Bagley	1	2	3	4	5	6	7	8	9	-
Blackduck	1	5	3	7	6	8	2	4	-	-
Barnum	1	2	3	5	4	9	7	6	8	10
Brewster	1	2	3	4	5	10	6	7	8	9
Deephaven	5	9	2	7	8	4	3	1	6	10
Elbow Lake	1	2	3	4	5	8	6	9	7	-
Eveleth	1	3	2	4	5	9	6	7	8	-
Faribault	6	2	4	1	7	3	5	8	9	10
Fisher	1	2	3	5	6	7	4	8	9	10
Glyndon	1	2	5	4	3	9	8	6	7	10
Granite Falls	1	2	3	4	5	7	6	-	-	8
Harmony	3	1	5	2	4	6	7	9	8	10
Hill City	5	-	1	2	3	8	4	6	7	-
Hinckley	5	4	1	3	2	6	7	8	9	10
Howard Lake	4	5	6	7	8	9	1	2	3	-
Hutchinson	1	5	2	6	7	8	3	4	9	10
International Falls	4	1	5	2	3	6	-	-	-	-

School	Horses	Beef Cattle	Dairy Cattle	Swine	Sheep	Poultry	Feeds & Feeding	Breeding	Veterinary	Bees
Lanesboro	4	2	1	3	5	6	7	8	9	10
Le Sueur	6	3	2	1	4	5	-	-	-	-
Mankato	1	2	3	5	4	6	7	8	9	-
McIntosh	1	3	2	4	5	8	6	7	9	10
Medford	4	3	2	6	7	5	1	8	9	10
Melrose	3	2	4	1	5	6	7	8	9	-
Milaca	1	2	3	9	8	5	4	6	7	-
Montgomery	1	2	4	3	5	6	7	8	9	-
Morgan	1	5	3	7	8	9	2	4	6	10
Northfield	1	6	5	8	9	7	4	2	3	10
Pegnot	1	3	2	4	5	9	6	8	7	-
Preston	6	1	7	2	4	5	3	-	-	-
Red Wing	1	2	3	4	5	6	7	8	-	-
Round Lake	3	1	2	4	5	9	7	6	8	10
St.Cloud	2	3	4	6	5	1	8	9	10	7
South St.Paul 17-18	5	2	1	3	4	7	6	9	-	8
South St.Paul 19-20	1	2	3	5	4	7	6	-	-	8
Two Harbors	3	2	1	5	4	6	-	-	-	-
Wadena	5	1	2	3	4	8	6	7	9	10
Warren	7	2	3	5	4	8	7	6	9	-
Walker	1	3	8	9	2	7	4	5	-	6
Westbrook	1	3	4	7	5	6	2	-	-	-

SUMMARY TABLE #4 (b)

The Order of Presentation of the Main Subjects
of the Animal Husbandry Course

Main Subjects	First	Second	Third	Fourth	Fifth	Sixth	Seventh	Eighth	Ninth	Tenth
Horses	<u>23</u>	1	5	5	5	4	-	-	-	-
Beef Cattle	6	<u>19</u>	9	1	4	1	-	-	1	-
Dairy Cattle	6	11	<u>14</u>	5	4	1	1	1	-	-
Swine	4	4	6	<u>10</u>	6	4	5	1	2	-
Sheep	-	2	3	12	<u>15</u>	2	3	4	1	-
Poultry	1	0	1	1	6	<u>13</u>	5	7	7	1
Feeds and Feeding	2	3	3	6	1	9	<u>13</u>	2	-	-
Breeding	1	2	0	3	1	6	5	<u>13</u>	4	-
Veterinary	-	-	2	-	-	2	5	6	<u>15</u>	1
Bees	-	-	-	-	-	1	1	3	1	<u>16</u>

This table clearly indicates the order of presentation of the main topics offered in an Animal Husbandry course in the Non - Smith - Hughes schools. The figures underscored show where in the sequence the largest number of schools places the various topics in their course.

With Horses, twenty-three schools as compared with twenty, place the topic first, all but four being in the first five places. With Beef Cattle, nineteen schools offer it second and thirty-four somewhere in the first three places. Dairying is prominent in the first three places also, being offered by thirty-two, but by fourteen in the third place.

The order is indicated by the underscoring and happens to be that in which the subjects are written. As suggested on a preceding page, Horses comes first, later on Poultry followed by Feeds and Feeding. It is quite probable that this uniformity is due to the fact that Projects are not required.

TIME ALLOTMENT TABLE #5 (a)

The Number of Days given to each of the Main Topics of the
Animal Husbandry Course

School	Introduction	Poultry	Feed-Feeding	Swine	Sheep	Horses	Beef Cattle	Dual-Purpose	Dairy Cattle	Milk	Bees	Breeding
Albert Lea	-	22	5	21	4	11	9	-	30	16	-	2
Alexandria	1	17	10	15	16	18	8	1	36	4	-	-
Blue Earth	-	15	6	20	13	13	16	-	15	5	2	3
Cannon Falls	1	9	8	18	13	20	14	2	28	3	-	3
Chatfield	1	19	15	30	15	20	15	-	45	10	5	5
Cokato	1	22	7	20	12	15	17	8	26	5	-	<u>15</u>
Deer River	1	29	10	20	20	20	15	5	30	7	3	5
Fairmont	1	16	4	21	10	14	15	2	28	5	-	3
Fosston	1	17	10	24	20	20	20	4	42	7	4	6
Grand Rapids	1	16	4	18	16	20	10	5	40	6	2	2
Hector	-	14	9	29	5	15	18	-	43	5	5	7
Jackson	1	19	5	15	9	19	9	4	32	5	5	7
Kasson	2	22	4	24	19	25	18	6	42	8	-	6
Madelia	1	21	3	30	<u>25</u>	30	26	9	27	6	2	2
Mantorville	-	5	13	16	2	6	4	5	<u>46</u>	5	-	8
Montevideo	1	20	<u>32</u>	21	11	23	15	-	25	6	-	4
New Richland	1	17	-	17	9	19	6	3	31	8	-	4
Norwood Y. A.	1	25	6	<u>33</u>	19	23	9	3	42	7	2	4
Owatonna	1	8	5	22	14	16	14	3	32	4	2	2
Park Rapids	3	27	5	25	15	20	16	4	46	9	5	5
Pipestone	1	16	3	18	13	16	20	1	22	6	2	3

School	Introduction	Poultry	Feed-Feeding	Swine	Sheep	Horses	Beef Cattle	Dual-Purpose	Dairy Cattle	Milk	Bees	Breeding
Renville	2	20	20	20	10	21	16	10	36	10	3	8
Sandstone	-	<u>36</u>	9	18	15	21	6	5	<u>53</u>	6	8	5
Thief River Falls 36	1	18	10	23	19	22	22	-	34	6	-	5
Thief River Falls 24	1	10	16	13	17	13	16	-	28	5	-	-
Virginia	-	30	1	18	22	21	18	-	36	7	-	1
Total 26	24	301	220	549	363	481	382	80	895	164	50	115
Average	1	12	9	21	14	19	15	3	34	6	2	4
Median	1	19	6	20	14	20	15	2	32	6	2	4
Mode	1	17	5	18	13	20	16	3	36	6	2	5
Range	0 3	5 36	0 32	13 33	2 25	6 30	4 26	0 10	15 53	3 16	0 8	0 15

This table is of value in that it indicates the relative amount of time spent upon the main subdivisions of Animal Husbandry. Due to the fact that the six and nine months courses are figured together the averages, medians and modes are proportionate rather than actual days. In most cases they agree closely, this giving them added value as criteria.

The range in most cases seems too great. However, considering the extent of the state and the diverse farming conditions, this wide range is not so surprising. In Smith - Hughes work less uniformity might be expected also, due to the requirements of the project.

Some figures have been underscored to call attention to unusual variation.

TIME ALLOTMENT TABLE #5 (b)

School	Intro- function	Poultry	Feed- Feeding	Swine	Sheep	Horses	Beef Cattle	Dual- Purpose Dairy Cattle	Milk	Bees	Breeding	
Aitkin	5	10	20	20	20	10	25	10	25	10	5	20
Appleton	1	<u>28</u>	10	24	20	23	28	-	34	6	-	6
Austin	1	19	3	27	15	32	16	4	24	6	-	2
Bagley	-	15	20	20	15	25	20	10	30	15	-	10
Blackduck	2	15	<u>25</u>	15	25	15	15	<u>38</u>	40	10	<u>12</u>	5
Barnum	4	8	20	12	15	20	25	5	30	8	4	<u>25</u>
Brewster	1	8	8	7	4	6	6	-	7	2	1	4
Deephaven	5	15	10	5	5	10	5	-	20	5	<u>15</u>	-
Elbow Lake	-	22	10	<u>33</u>	24	33	14	5	31	5	-	3
Eveleth	<u>15</u>	18	2	20	16	25	20	-	18	5	-	6
Faribault	3	10	5	34	17	<u>40</u>	20	5	36	3	2	5
Fisher	5	15	10	15	10	20	10	<u>30</u>	20	5	5	5
Glyndon	3	23	17	21	12	21	15	15	35	13	5	5
Granite Falls	10	10	10	20	15	25	15	5	31	5	3	5
Harmony	5	19	8	23	13	27	<u>30</u>	5	26	7	5	10
Hill City	1	22	15	25	14	21	9	1	40	17	-	3
Hinckley	1	21	7	23	14	24	16	8	43	-	5	10
Howard Lake	1	18	9	<u>34</u>	2	21	10	7	29	10	-	5
Hutchinson	1	10	<u>20</u>	20	15	20	15	1	50	5	3	5
International Falls	-	<u>48</u>	-	32	<u>28</u>	30	15	3	<u>57</u>	6	-	-
Lanesboro	2	20	5	29	12	25	26	5	42	5	3	8
Le Sueur	-	20	-	<u>40</u>	15	25	20	-	50	10	-	-
Mankato	4	26	5	26	15	28	17	5	35	5	-	4
McIntosh	3	20	7	15	15	20	25	3	30	6	3	5

School	Introduction	Poultry	Feed-Feeding	Swine	Sheep	Horses	Beef Cattle	Dual-Purpose	Dairy Cattle	Milk	Bees	Breeding
Medford	2	20	4	18	7	20	13	7	35	15	3	9
Melrose	3	20	10	25	15	25	20	5	25	10	-	5
Milaca	5	6	9	15	5	10	8	2	<u>63</u>	5	1	3
Montgomery	5	15	10	20	10	20	20	5	30	10	-	<u>20</u>
Morgan	-	17	14	25	13	28	23	11	38	7	3	9
Northfield	-	25	<u>20</u>	20	20	20	10	5	25	5	-	-
Pequot	-	10	<u>30</u>	20	15	<u>35</u>	10	5	<u>45</u>	10	-	5
Preston	-	20	-	30	16	25	<u>45</u>	-	39	5	-	-
Red Wing	2	10	10	20	8	30	25	5	40	20	-	10
Round Lake	5	20	20	20	10	20	20	-	30	10	5	5
St. Cloud	1	24	6	23	13	26	15	5	30	12	8	7
South St. Paul 17-18	2	19	9	29	18	32	25	7	<u>57</u>	13	4	5
South St. Paul 19-20	5	21	10	12	12	24	20	3	23	10	<u>10</u>	4
Two Harbors	10	22	10	18	12	25	8	1	33	10	-	7
Wadena	-	16	12	26	19	30	17	4	36	10	5	5
Warren	2	14	11	16	16	22	18	5	33	3	1	7
Walker	4	25	21	13	16	16	11	5	25	10	9	13
Westbrook	-	10	3	10	10	15	11	1	14	3	-	-

	Introduction	Poultry	Feed-Feeding	Swine	Sheep	Horses	Beef Cattle	Dual-Purpose	Dairy Cattle	Milk	Bees	Breeding
Total 42	119	754	455	900	613	1059	736	251	1404	337	120	270
Average	3	18	11	21	15	25	17	6	33	8	3	6
Median	2	19	10	20	15	25	16	5	31	7	1	5
Mode	2	20	10	20	15	25	15	5	30	10	5	5
Range	0 15	6 48	2 30	5 40	2 28	6 40	5 45	0 38	7 63	0 20	0 15	0 25

In this table the range may be somewhat misleading. Three schools (Brewster, Deephaven and Westbrook) which have courses of less than six months, are included. This makes the lower range less than it otherwise would be. All other schools in this table offer nine months courses.

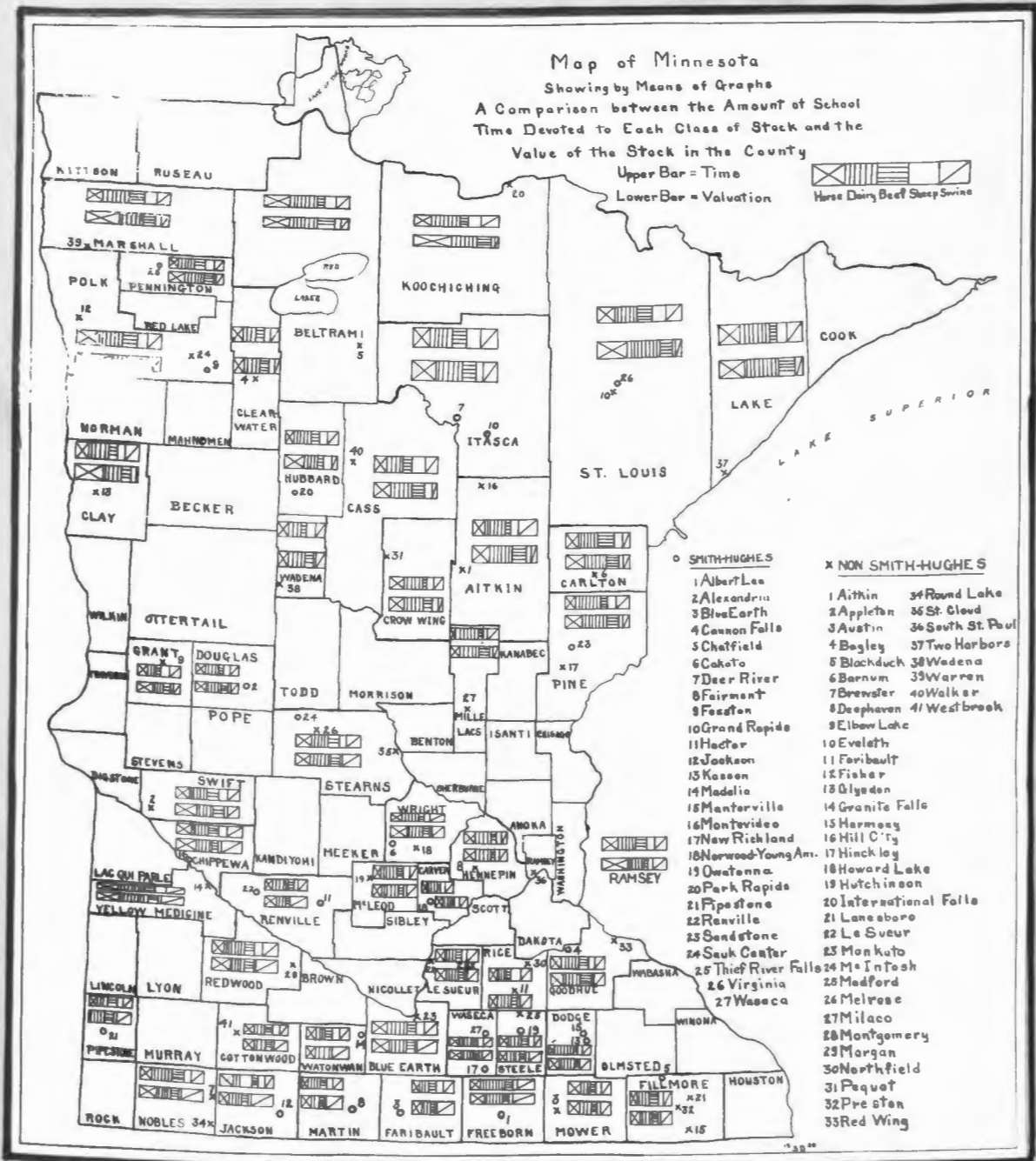
The averages, medians and modes conform well where a large number of schools offer the subject. Figures showing marked nonconformity are underscored. In most cases this can readily be accounted for by noting the kind of farming emphasized in the community. In other cases, no legitimate reason is discoverable.

South St. Paul is an interesting example of time allotment by different men in the same school. In the school year of 17-18, twenty-nine days were devoted to Swine, while in 19-20 there were but twelve days given to this same subject. During the earlier year, fifty-seven days (one-fourth to one-third the total time) was spent on Dairy Cattle, while this year but twenty-three days was given to the subject. There

is probably some discrepancy in the method of figuring "days" by one of these two instructors but this would not be so great as to cause the extreme variation.

Blanks under these topics may in most cases be readily accounted for. Where found in the "Introduction" column, they indicate that the work was started abruptly by taking up a special topic without a preliminary view of the whole field or of its importance. Where Feeds and Feeding and Breeding have apparently been omitted, they are found to have been treated under the different types of livestock, and no general discussion entered into. Dual-Purpose Cattle often taken up under Beef.

In both cases of extreme emphasis on Dual Purpose Cattle, (Blackduck and Fisher) both schools are in the northern part of the state where it is generally conceded that this type of animal has a place. Swine emphasis seems to be legitimate in the counties where it is found. The same thing is true of Sheep at International Falls. There is no very evident reason why Paribault and Pequot should devote so much time to Horses. Harmony and Preston, both in Fillmore County have undoubtedly a good reason for spending thirty and forty-five days respectively on Beef Cattle. The extreme cases in Dairy Cattle emphasis are found at Milaca and International Falls. The territory surrounding each is well suited to this type of farming and though present values may not indicate the need of so much time, future prospects make the amount of time spent more reasonable.



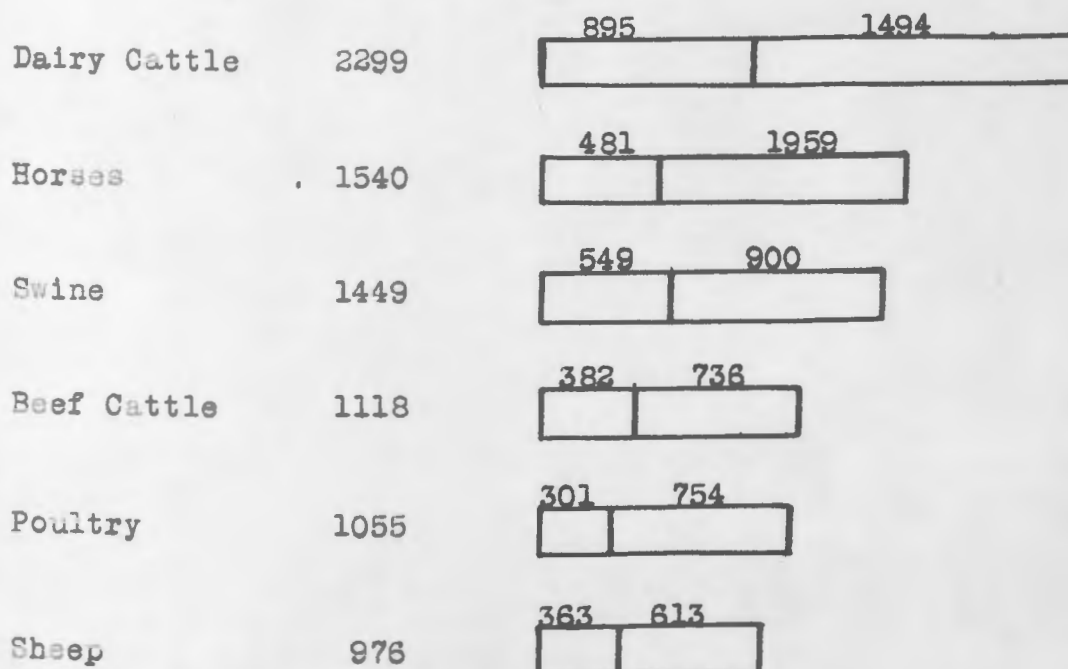
The bars in the above map are not intended to show relative proportions between the various counties, but only proportions within each county.

GRAPH # 1

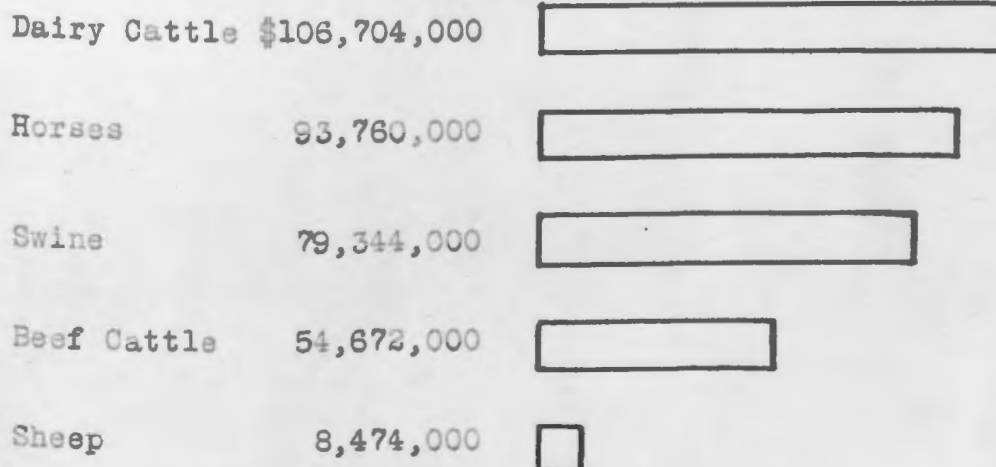
Proportionate Number of Days Given to each Class of Live Stock in all Schools, compared with Proportionate Values" of classes of Live Stock* in the State of Minnesota.

(In the first section of the graph, the first figure represents the total days, the second one the Smith-Hughes days and the third, the non Smith-Hughes days)

Days



Value



* No figures available on Poultry
 " See " footnote on Page 1

This graph brings out quite clearly that in the aggregate the schools of the state are apportioning the proper amount of time to each class of live stock. This is true provided the criteria used is the money valuation of the stock.

The figures for valuation are taken from the Report on Minnesota Livestock for 1919-20 made by the Field Agent for the United States Department of Agriculture. These valuations refer only to the animal itself and do not account for the products, such as milk and wool.

TIME ALLOTMENT TABLE #6 (a)

The Number of Days Given to Each of the Sub-Topics under

POULTRY

School	Introduction	Types	Breeds	Judging	Eggs	Incubation	Brooding	Feeding	Houses	Equipment	Care	Marketing	Total
Albert Lea	-	1	6	4	1	2	2	4	3	2	2	1	29
Alexandria	.5	-	6	1	.5	1	1	1.5	3	1	1	.5	17
Blue Earth	.5	1	5	2	1	1	2	-	-	2	-	-	14.5
Cannon Falls	.5	.5	3	1	.5	.5	.5	.5	.5	.5	.5	.5	9
Chatfield	1	1	2	2	1	1	1	4	1	1	2	2	19
Cokato	.5	.5	4	1	1	1	1	6	1	1	1	2	20
Deer River	1	1	2	4	1	4	3	4	4	2	2	1	29
Fairmont	.5	.5	3	3	.5	1	.5	5	.5	.5	.5	.5	16
Fosston	1	1	2	2	1	2	1	2	1	1	2	1	17
Grand Rapids	1	1	2	2	1	1	1	3	1	1	1	1	16
Hector	1	2	2	1	.5	.5	1	3	1	1	1	-	14
Jackson	1	4	1	3	1	2	1	2	1	1	1	1	19

Schools	Introduction	Types	Breeds	Judging	Eggs	Incubation	Brooding	Feeding	Houses	Equipment	Care	Marketing	Total
Kasson	1	2	4	2	1	2	1	3	2	1	1	1	21
Madelia	1	2	3	3	2	1	1	2	2	1	2	1	21
Mantorville	-	1	1	-	-	.5	-	1	-	.5	.5	-	5
Montevideo	1	1	2	-	2	1	1	4	3	2	2	1	20
New Richland	1	1	2	2	1	2	1	3	1	1	1	1	17
Norwood Y.A.	1	2	5	2	-	-	1	8	2	1	2	1	25
Owatonna	1	1	3	1	-	.5	-	1	.5	-	-	-	8
Park Rapids	1	1	4	2	3	2	2	5	3	1	2	1	27
Pipestone	1	1	2	2	.5	.5	.5	5.5	.5	.5	1.5	.5	16
Renville	1	1	3	2	1	2	2	2	2	1	2	1	20
Sandstone	1	6	5	6	1	3	4	2	1	2	4	1	36
Thief River Falls 36	-	2	3	-	1	2	2	3	1	1	1	-	18
Thief River Falls 24	-	1	2	-	1	1	-	4	-	1	-	-	10
Virginia	1	1	3	3	-	1	1	13	1	1	1	2	28
Waseca	1	1	1	1	-	1	1	1	1	1	1	1	11

	Introduction	Types	Breeds	Judging	Eggs	Incubation	Brooding	Feeding	Houses	Equipment	Care	Marketing	Total
Total 27	21.5	37.5	76	52	24	36.5	33	92.5	37.5	29	35	22	
Average	.6	1.4	2.8	2	1	1.4	1.2	3.4	1.4	1	1.3	.8	18.5
Median	1	1	3	2	1	1	1	3	1	1	1	1	17
Mode	1	1	2	2	1	1	1	3	1	1	1	1	16
Range	0	0	1	0	0	0	0	0	0	0	0	0	5
	1	6	6	6	3	4	4	13	4	2	4	2	36

All schools reporting devoted some time to Poultry study. It hardly seems, however, that much progress could be made with only five lessons. This is particularly true in a Smith - Hughes school where the purpose is entirely vocational. In this short time but a single part of the work could be covered, such as Types and Breeds, Housing and Equipment or Care and Management. With the Mode and Median showing at sixteen and seventeen days, five seems too little.

That a school should spend six days on Types and only five days on Breeds hardly seems justifiable. "Type" usually refers to purpose of the animal, that is with birds, meat general purpose and egg types. This is important, but much simpler to develop than breed characteristics. The surplus time used on type might better be devoted to Feed, Housing and Equipment.

In general, not enough time is devoted to housing and equipment. This is a matter that is notoriously neglected on the average farm and one that would repay improvement.

One school gives thirteen days to feeding, but there seems to be a good deal of general material as a basis for all stock feeding.

TIME ALLOTMENT TABLE #6 (b)

School	Introduction	Types	Breeds	Judging	Eggs	Incubation	Brooding	Feeding	Houses	Equipment	Care	Marketing	Total
Aitkin	-	1	1	2	1	1	1	1	.5	.5	.5	.5	10
Appleton	2	3	2	3	2	3	2	3	2	3	3	-	28
Austin	1	2	5	2	1	1	2	-	2	1	1	1	19
Bagley	-	.5	.5	2	1	2	1	2	1	1	3	1	15
Blackduck	1	1	2	1	1	1	1	1	1	1	2	2	15
Deephaven	1	2	2	-	-	-	-	2	2	2	3	1	15
Elbow Lake	1	2	3	2	1	2	1	2	2	2	2	2	22
Eveleth	2	2	1	1	1	2	1	2	2	2	1	1	18
Faribault	1	1	1	1	-	1	1	3	.5	.5	-	-	10
Glyndon	1	3	3	2	1	2	2	3	2	1	2	1	20
Granite Falls	.5	1	1	1	.5	.5	-	2	1	.5	2	1	13
Harmony	1	1	3	2	1	2	1	3	1	1	1	2	16
Hill City	1	1	2	3	2	2	2	3	1	1	3	1	22
Hinckley	1	5	5	2	1	1	1	1	1	1	1	1	21
Howard Lake	1	.5	1.5	1	2	3	2	3	1	1	1.5	.5	18
Hutchinson	-	1	2	-	-	1	-	1	2	1	1	1	10
International Falls	2	2	3	4	1	8	4	8	3	6	4	3	32
Lanesboro	1	2	2	2	2	2	1	2	2	1	2	1	20
Le Sueur	-	1	3	2	1	2	2	5	1	1	1	1	20
Mankato	1	2	5	3	1	2	2	3	2	2	2	1	26
McIntosh	1	1	3	2	1	2	1	4	2	1	1	1	20

School	Introduction											Total	
	Types	Breeds	Judging Eggs	Incubation Brooding	Feeding Houses	Equipment	Care	Marketing					
Medford	1	1	2	3	1	1	1	3	3	2	1	1	20
Milaca	-	1	-	1	-	-	-	1	1	-	1	1	6
Morgan	1	1	2	2	1	2	1	3	-	1	2	1	17
Preston	-	2	3	2	1	1	2	3	3	2	1	-	20
Red Wing	-	2	5	-	-	1	-	1	1	-	-	-	10
St. Cloud	1	2	4	2	1	2	1	3	2	2	2	2	24
So. St. Paul 17-18	1	1	5	1	1	1	1	3	2	1	2	2	21
So. St. Paul 19-20	1	1	4	2	1	3	1	1	2	1	1	1	19
Two Harbors	1	1	5	1	1	2	1	2	2	2	3	1	22
Wadena	1	1	3	3	1	.5	.5	2	2	-	1	1	16
Warren	.5	.5	3	2	1	1	.5	2	1	1	1	.5	11
Walker	1	3	3	2	1	1	3	5	1	1	3	1	25
Westbrook	-	-	2	1	1	1	1	1	1	1	1	-	10

	Introduction											Total	
	Types	Breeds	Judging Eggs	Incubation Brooding	Feeding Houses	Equipment	Care	Marketing					
Totals	28.5	52.5	92	60	32.5	57	39	64	54	44.5	56	34	
Average	.8	1.5	2.7	1.8	1	1.7	1.1	2	1.6	1.3	1.7	1	18.2
Median	1	1	3	2	1	1	1	2	2	1	1	1	17
Mode	1	1	3	2	1	1	1	3	2	1	1	1	18
Range	0	0	0	0	0	0	0	0	0	0	0	0	6
	2	5	5	4	2	8	4	8	3	6	4	3	32

The non - Smith - Hughes courses are very similar to the other type in time allotment. As with the Smith - Hughes, too little time is devoted in some cases to do more than skim over the subject.

TIME ALLOTMENT TABLE #7 (a)

The Number of Days Given to Each of the Sub-Topics under

Feeds and Feeding

Schools.	Composition of Feeds	Digestion	Feeding Standards	Total
Albert Lea	2	1	5	8
Alexandria	5	3	2	10
Cannon Falls	2	3	3	8
Chatfield	5	2	2	9
Cokato	1	2	4	7
Deer River	2	4	4	10
Fairmont	2	4	4	10
Fosston	3	3	4	10
Grand Rapids	1	2	1	4
Hector	4	2	3	9
Jackson	2	1	2	4
Kasson	2	1	1	4
Madelia	1	1	1	3
Mantorville	6	5	2	13
Montevideo	15	10	7	32
New Richland	2	2	2	6
Norwood Y. A.	2	2	2	6

	Composition of Feeds	Digestion	Feeding Standards	Total
Owatonna	2	2	3	7
Park Rapids	2	2	1	5
Pipestone	1	1	1	3
Renville	10	10	-	20
Sandstone	2	3	4	9
Thief River Falls 36	5	3	2	10
Thief River Falls 24	4	2	1	7
Total 24	81	63	59	
Average	3.3	2.6	2.4	8.3
Median	2	2	2	6
Mode	2	2	2	6
Range	0 15	0 10	0 7	3 32

There is too great a range in this subject. Madelia and Montevideo, both in the same section of the state offer three and thirty-two days respectively. It is hard to account for this in a general subject like Feeds and Feeding.

In number of total days spent on the sub-topics, in order of importance composition of feeds ranks first, digestion second and standards third.

TIME ALLOTMENT TABLE #7 (b)

Feeds and Feeding

Schools	Composition of Feeds	Digestion	Feeding Standards	Total
Aitkin	5	5	10	20
Appleton	3	3	4	10
Austin	1	1	3	5
Bagley	5	5	10	20
Blackduck	18	4	3	25
Deephaven	4	2	4	10
Elbow Lake	2	3	5	10
Eveleth	2	-	-	2
Faribault	3	1	1	5
Glyndon	7	5	5	17
Granite Falls	5	5	-	10
Harmony	4	2	2	8
Hill City	6	6	3	15
Hinckley	3	1	3	7
Howard Lake	2	3	4	9
Hutchinson	5	7	8	20
Lanesboro	3	2	-	5
Mankato	2	2	1	5
McIntosh	2	2	3	7
Medford	4	2	4	10
Milaca	3	2	4	9

Schools	Composition of Feeds	Digestion	Feeding Standards	Total
Morgan	2	2	6	10
Red Wing	4	3	3	10
St. Cloud	2	2	2	6
So. St. Paul 17-18	5	2	2	9
So. St. Paul 19-20	5	2	3	10
Two Harbors	3	5	2	10
Wadena	3	2	1	6
Warren	5	3	3	11
Walker	4	7	10	21
Westbrook	1	1	1	3
Total 32	123	92	111	
Average	4	3	3.5	10.5
Median	3	2	5	10
Mode	3	2	5	10
Range	0 18	0 7	0 8	2 25

This table varies from 7 (a) somewhat in the time proportion among the three sub-topics. Feeding standards is placed second over digestion. While there are arguments for both placings it seems that the matter of making up a ration for an animal is more important to know than how he digests the food. Several schools in this table, however, do not spend any time on feeding standards.

TIME ALLOTMENT TABLE #8 (a)

The Number of Days Given to Each of the Sub-Topics under

Schools	Introduction	Swine						Fattening	Disease	Houses	Equipment	Care	Marketing	Total
		Types	Breeds	Judging	Feeds	Feed'g Br. Herd	Feed'g the Pigs							
Albert Lea	1	1	2	4	1	1	1	2	1	3	1	2	1	21
Alexandria	1	1	2	2	2.5	2	-	.5	2	2	-	-	-	15
Blue Earth	.5	3	5	-	3	1	1	1	1	1	1	2	-	19.5
Cannon Falls	.5	.5	4	2	3	1	1	1	1	.5	.5	2	1	18
Chatfield	1	1	3	5	5	1	2	3	4	1	-	3	1	31
Cokato	1	1	2	2	3	3	1	1	1	1	1	2	1	21
Deer River	1	2	3	3	2	1	1	1	1	2	1	1	1	20
Fairmont	.5	.5	3	6	2	1	1	1	2	2	.5	1	.5	21
Fosston	1	1	6	5	2	1	1	1	1	1	1	2	1	24
Grand Rapids	1	1	3	3	2	1	1	1	1	1	1	1	1	18
Hector	1	1	5	3	4	2	2	2	2	2	1	3	1	29
Jackson	1	1	1	3	1	1	-	1	1	1	1	1	1	14
Kasson	1	2	7	3	2	2	1	1	1	1	1	1	1	24
Madelia	1	2	3	3	5	3	1	1	4	2	1	3	1	30
Mantorville	1	2	2	2	1	1	2	1	2	.5	.5	.5	.5	16
Montevideo	1	1	3	4	2	1	2	1	1	2	1	1	1	21
New Richland	1	1	2	3	2	1	1	1	1	1	1	1	1	17
Norwood Y.A.	1	1	8	4	5	2	1	2	2	3	0	2	2	33
Owatonna	1	1	4	6	3	1	1	-	1	1	1	1	1	22
Park Rapids	1	1	3	3	5	2	1	2	2	2	1	1	1	25
Pipestons	1	.5	5	3	2	1	1	1	1	.5	.5	.5	1	18

Schools	Introduction	Types	Breeds	Judging	Feeds	Feeding Breeding Herd.	Feeding the Pigs	Fattening	Disease	Houses	Equipment	Care	Marketing	Total
Renville	1	1	4	2	2	2	1	1	2	.5	.5	2	1	20
Sandstone	1	1	4	2	1	1	1	1	1	1	1	2	1	18
Thief River Falls 36	1	1	6	4	5	1	2	1	1	.5	.5	-	-	22
Thief River Falls 24	1	1	5	3	4	2	2	2	2	2	1	3	1	29
Virginia	1	1	3	5	3	1	2	1	1	.5	.5	-	-	19
Waseca	1	.5	.5	1	2	1	1	1	1	1	1	1	1	14

	Introduction	Types	Breeds	Judging	Feeds	Feeding Breeding Herd	Feeding the Pigs	Fattening	Disease	Houses	Equipment	Care	Marketing	Total
Total 27	24.5	31	95.5	86	74.5	37	31	31.5	40	34	19.5	36	22	
Average	.9	1.2	3.5	3.2	2.7	1.3	1	1	1.4	1.2	.7	1.3	.8	19.9
Median	1	1	3	3	2	1	1	1	1	1	1	1	1	18
Mode	1	1	3	3	2	1	1	1	1	1	1	1	1	18
Range	0	.5	.5	0	1	1	0	0	0	0	0	0	0	14
	1	1	8	6	5	5	2	3	2	3	1	3	2	33

There is nothing particularly outstanding brought out by this table. The subject of Swine has evidently become fairly well standardized. In one case, however, but one day is devoted to Types and Breeds. It would not seem possible to cover these important topics in this time. In this particular locality also, hogs are of much importance.

TIME ALLOTMENT TABLE #8 (b)

Schools	Introduction	<u>Swine</u>											Total	
		Types	Breeds	Judging	Feeding Breeding Herd	Feeding the Pigs	Fattening	Disease	Houses	Equipment	Care	Marketing		
Aitkin	1	3	3	3	3	1	1	1	2	.5	.5	.5	.5	21
Appleton	-	1	3	3	3	2	2	3	2	1	1	2	1	24
Austin	1	1	10	2	1	3	2	2	3	1	1	2	1	30
Bagley	1	1	1	3	2	1	1	3	2	1	1	2	1	20
Blackduck	.5	.5	2	2	1	1	1	1	1	1	.5	2	1.5	15
Deephaven	1	1	-	-	1	-	-	1	-	-	-	1	-	5
Elbow Lake	1	2	8	2	3	1	2	1	5	2	2	2	2	33
Eveleth	2	2	2	2	1	-	2	-	2	2	1	2	2	20
Faribault	2	1	8	5	-	3	2	2	2	2	1	4	2	34
Glyndon	1	2	3	2	2	1	2	1	3	1	1	1	1	21
Granite Falls	1	1	1	2	1	1	1	1	1	1	.5	1	1	13.5
Harmony	1	2	2	3	2	2	2	2	2	2	1	1	1	23
Hill City	1	1	3	4	5	1	2	1	2	2	1	2	-	25
Hinckley	1	4	2	3	1	1	2	1	3	1	1	1	2	23
Howard Lake	1	1	2	7	3	3	3	3	2	2	2.5	3	1.5	34
International Falls	1	2	2	5	8	1	1	2	4	2	1	3	1	33
Lanesboro	1	2	2	2	3	3	2	2	5	2	1	3	1	29
Le Sueur	1	1	5	3	10	3	4	3	5	3	2	-	-	40
Mankato	1	2	6	3	2	2	2	1	2	2	1	2	1	27
McIntosh	1	1	5	2	1	1	-	1	1	1	1	-	-	15
Medford	.5	.5	1	2	2	1	1	2	2	1.5	1.5	1	2	18

School	Introduction	Types	Breeds	Judging	Feeds	Feeding Breeding Herd	Feeding the Pigs	Fattening	Disease	Houses	Equipment	Care	Marketing	Total
Milaca	1	1	-	3	3	2	1	1	1	1	-	1	-	15
Morgan	1	1	2	4	2	3	2	2	1	1	1	4	1	25
Preston	1	2	5	7	2	1	2	3	2	2	1	1	1	30
Red Wing	-	3	9	1	-	-	-	2	2	1	1	1	-	20
St.Cloud	1	2	5	2	2	3	1	2	1	1	1	2	1	24
So.St.Paul 17-18	1	1	8	4	2	2	3	2	2	1	1	1	1	29
So.St.Paul 19-20	1	1	-	3	.5	1	.5	1	3	-	-	-	1	12
Two Harbors	1	1	4	1	2	1	1	1	2	1	1	1	1	18
Wadena	-	1	4	6	1	1	1	1	3	3	1	3	1	26
Warren	.5	.5	5	2	2	5	1	.5	1	1	.5	1	.5	16
Walker	.5	-	2	1	1	1	1	1	.5	1	.5	3	.5	13
Westbrook	-	1	2	2	2	.5	.5	-	1	.5	.5	1	-	12

	Introduction	Types	Breeds	Judging	Feeds	Feeding Breeding Herd	Feeding the Pigs	Fattening	Disease	Houses	Equipment	Care	Marketing	Total
Total 33	29	43.5	121	97	73.5	50	49	50.5	45	42.5	31	54.5	30.5	
Average	.8	1.3	3.4	2.4	2.2	1.5	1.5	1.5	1.3	1.3	.9	1.6	.8	19.9
Median	1	1	2	2	2	1	1	1	2	2	1	1	1	19
Mode	1	1	2	2	2	1	2	1	2	1	1	1	1	18
Range	0	0	0	0	0	0	0	0	0	0	0	0	0	5
	2	4	10	7	10	3	4	3	5	3	2.5	4	2	40

The noticeable thing in this table is that in some cases no time whatever is spent on such important things as types, breeds, feeding and housing. It is inconceivable that hogs could be studied even in the most "cultural" way without a discussion of these points.

A wide range is to be expected due to the unevenness of hog distribution throughout the state.

TIME ALLOTMENT TABLE #9 (a)

The Number of Days Given to Each of the Sub-Topics under
Sheep

Schools	Introduction	Types	Breeds	Judging	Feeding	Care	Diseases	Marketing	Total
Albert Lea	-	.5	.5	-	1	1	-	1	4
Alexandria	.5	.5	5	2	5	2	1	-	16
Blue Earth	.5	.5	1.5	4.5	2	1	1	1	11
Cannon Falls	.5	.5	4	2	2	2	1	1	13
Chatfield	1	1	2	1	3	4	2	1	15
Cokato	.5	.5	3	3	1	2	1	1	12
Deer River	1	2	3	3	3	4	2	2	20
Fairmont	.5	.5	2	2	2.5	1	1	.5	10
Fosston	1	1	5	5	5	1	1	1	20
Grand Rapids	1	1	3	3	5	1	1	1	16
Hector	1	1	2	-	.5	.5	-	-	5

Schools	Introduction	Types	Breeds	Judging	Feeding	Care	Diseases	Marketing	Total
Jackson	1	1	1	2	1	1	1	1	19
Kasson	1	1	7	3	4	1	1	1	25
Madelia	1	1	4	3	5	4	4	3	25
Mantorville	-	.5	1	-	-	-	.5	-	2
Montevideo	1	1	2	2	2	2	1	-	11
New Richland	1	1	2	1	1	1	1	1	9
Norwood Y.A.M.	1	1	5	3	5	1	2	1	19
Owatonna	1	1	3	4	1	1	1	2	14
Park Rapids	1	1	3	2	4	1	2	1	15
Pipestone	1	1	3	2	3	1	1	1	13
Renville	1	1	2	2	1	1	1	1	10
Sandstone	2	1	4	3	1	1	2	1	15
Thief River Falls 36	1	1	5	5	2	3	2	-	19
Thief River Falls 24	-	1	5	4	3	3	1	-	17
Virginia	2	2	4	3	4	5	1	1	22
Waseca	1	1	1	1	1	2	1	-	8

	Introduction	Types	Breeds	Judging	Feeding	Care	Diseases	Marketing	Total
Total 27	23.5	25.5	83	65.5	68.5	47.5	33.5	23.5	
Average	.8	.9	3	2.4	2.4	1.8	1.4	.8	12.7
Median	1	1	3	2	2	1	1	1	12
Mode	1	1	3	2	1	1	1	1	11
Range	0 2	.5 2	.5 7	0 5	.5 5	0 5	0 4	0 3	2 25

Here also a wide variation in amount of time would be expected. From two to twenty-five days are devoted to Sheep. Many of the large figures are found in the more northerly sections where sheep raising is just becoming important.

TIME ALLOTMENT TABLE #9 (b)

Sheep

Schools	Introduction	Types	Breeds	Judging	Feeding	Care	Diseases	Marketing	Total
Aitkin	1	2	4	4	3	2	2	2	20
Appleton	2	2	4	3	4	2	2	1	20
Austin	1	1	5	2	2	1	2	1	15
Bagley	1	1	2	3	2	3	2	1	15
Blackduck	1	1	2	2	2	3	2	2	15
Deephaven	1	1	-	-	1	1	1	-	5
Elbow Lake	-	2	12	2	2	2	2	2	24
Eveleth	2	2	2	2	2	2	2	2	16
Faribault	1	2	4	-	1	1	1	-	10
Glyndon	1	2	2	2	2	1	1	1	12
Granite Falls	1	2	5	1	2	2	1	1	15
Harmony	1	2	3	3	1	1	1	1	13
Hill City	1	1	3	2	4	2	1	-	14
Hinckley	1	2	2	3	1	1	2	1	13
Howard Lake	-	.5	.5	-	-	.5	.5	-	2
International Falls	1	2	2	3	8	5	5	2	28
Lanesboro	1	2	3	1	1	1	2	1	13
Mankato	1	2	5	2	1	1	2	1	15
McIntosh	1	1	5	2	2	2	1	1	15
Medford	.5	.5	1	2	1	.5	.5	1	7
Milaca	-	1	1	1	-	1	1	-	5

Schools	Introduction								Total
	Types	Breeds	Judging	Feeding	Care	Diseases	Marketing		
Morgan	1	1	2	2	2	3	1	1	13
Preston	1	2	4	4	2	1	1	1	16
Red Wing	1	2	4	-	1	-	-	-	8
St. Cloud	1	1	4	2	1	2	1	1	13
So. St. Paul 17-18	1	1	8	2	2	1	2	1	18
So. St. Paul 19-20	-	1	6	2	1	1	1	-	12
Two Harbors	1	1	3	1	1	1	3	1	12
Wadena	-	1	4	4	3	3	3	1	16
Warren	.5	1	7	4	1	1	1	.5	16
Walker	1	2	6	3	1	2	.5	.5	16
Westbrook	.5	1	2	1	2	2	1	.5	10

	Introduction								Total
	Types	Breeds	Judging	Feeding	Care	Diseases	Marketing		
Total 32	29.5	46	127.5	65	59.5	61	49.5	28.5	
Average	.9	1.4	4.1	2	1.8	2	1.5	.9	14.6
Median	1	1	3	2	2	1	1	1	12
Mode	1	2	2	2	1	1	1	1	11
Range	0	.5	0	0	0	0	0	0	1
	2	2	12	4	8	5	5	2	25

This does not differ materially from the Smith - Hughes table. Elbow Lake, however, devotes half of the twenty-four lessons to a study of the breeds. This seems somewhat extensive; some of the time might more profitably be given to care and feeding, with attention on the few important breeds.

TIME ALLOTMENT TABLE #10 (a)

The Number of Days Given to Each of the Sub-Topics under

Schools	Introduction	History	Types	<u>Horses</u>				Unsoundness	Feeding Costs	Feeding Work Horse	Feeding Mare	Feeding Colt	Care of Mare & foal	General Care	Diseases	Marketing	Total
				Breeds	Judging	Age											
Albert Lea	-	-	1	2	1	.5	.5	1	.5	1	.5	1	1	1	-	13	
Alexandria	-	1	2	3	3	1	1	-	.5	1	1	1	2	2	-	18.5	
Blue Earth	-	.5	.5	2	4	1	1	-	1	.5	1.5	.5	1	.5	-	14	
Cannon Falls	.5	.5	1	5	4	.5	1.5	1	1	.5	.5	2	1	.5	5	20	
Chatfield	1	-	1	2	3	1	2	1	2	1	1	1	1	2	1	20	
Cokato	.5	1	1.5	3	4	2	2	1	.5	.5	.5	.5	1	.5	-	18.5	
Deer River	.5	.5	1	3	2.5	.5	1	1	2	1	1	2	1	2	1	20	
Fairmont	.5	.5	1	3	2	1	1	1	.5	.5	5	.5	.5	.5	.5	13.5	
Fosston	.5	.5	1	3	3	1	2	2	1	1	1	1	1	1	1	20	
Grand Rapids	1	1	2	4	3	1	1	1	1	1	1	1	1	1	-	20	
Hector	1	1	1	4	2	.5	.5	1.5	1	-	-	1	1	.5	-	15	
Jackson	.5	.5	1	1	3	1	2	1	1	1	1	1	1	3	1	19	
Kasson	1	1	2	5	4	1	3	1	1	1	1	1	1	1	1	25	
Madelia	1	2	2	2	3	1	2	4	2	1	1	2	3	3	1	30	
Mantorville	-	-	1	2	1	.5	.5	-	-	-	-	.5	-	.5	-	6	
Montevideo	1	1	2	4	2	1	2	2	-	2	2	1	1	2	-	23	

Schools	Introduction	History	Types	Breeds	Judging	Age	Unsoundness	Feeding Costs	Feed'g Wk Horse	Feeding Mare	Feeding Colt	Mare & foal	General Care	Diseases	Marketing	Total
New Richland	1	1	1	2	3	1	1	2	1	1	1	1	1	1	1	19
Norwood Y.A.	1	1	1	6	4	1	1	1	1	1	1	1	1	2	-	23
Owatonna	1	-	1	3	4	-	2	-	-	1	1	1	1	1	-	16
Park Rapids	1	.5	.5	3	2	1	2	2	1	1	1	1	1	2	1	20
Pipestone	.5	.5	1	4	3	1	1	-	1	1	1	.5	.5	1	-	16
Renville	1	1	2	3	2	1	1	3	3	1	1	1	1	1	-	22
Sandstone	1	2	1	2	2	2	1	1	1	1	1	1	1	3	1	21
Thief River Falls 36	1	1	1	3	3	1	2	2	2	1	1	1	1	2	-	22
Thief River Falls 24	-	1	.5	1.5	3	1	1	2	2	1	1	1	-	1	-	15
Virginia	.5	.5	1	4	4	1	1	1	1	1	1	-	2	2	-	20
Waseca	.5	1	1	.5	2	1	1	1	1	1	-	.5	.5	1	-	12
Total 27	17.5	20.5	32	80	76.5	25.5	36	33.5	30	24	25	26	27.5	38	10	
Average	.6	.7	1.2	3	2.7	.9	1.3	1.2	1.1	.9	.9	1	1	1.4	.3	18.2
Median	.5	1	1	3	3	1	1	1	1	1	1	1	1	1	0	17.5
Mode	1	1	1	3	3	1	1	1	1	1	1	1	1	1	0	18
Range	0	0	.5	.5	1	0	5	0	0	0	0	0	0	.5	0	6
	1	2	2	6	4	2	3	4	3	2	2	2	3	3	1	30

The horses of the state are second in value ranking next to dairy cattle. They are often neglected, however, being used as a piece of machinery and with little careful attention given to breeding and care. Mares are not used enough. With careful management a mare may work the major part of the year and in addition produce a colt.

The range as shown by the table is six to thirty and the average eighteen. There is only one instance of this lowest figure. It does not seem possible to cover the subject properly in six lessons. Thirty may be too much; but in a horse breeding community it would probably be proper.

There is a tendency here, as in most classes of stock to spend too much time on breed study.

TIME ALLOTMENT TABLE #10 (b)

Schools	Horses													Total		
	Introduction	History	Types	Breeds	Judging	Age	Unsoundness	Feeding Costs	Feeding Work Horse	Feeding Mare	Feeding Colt	Care of Mare & foal	General care		Diseases	Marketing
Appleton	2	2	2	4	2	1	1	1	1	1	1	2	2	1	-	23
Austin	1	3	3	8	2	2	2	1	1	2	1	2	1	2	1	32
Bagley	1	1	2	2	3	1	3	1	1	2	1	1	2	3	1	25
Blackduck	1	1	2	5	4	2	2	7	2	1	1	2	5	2	1	38
Deephaven	-	2	-	2	1	1	1	1	-	-	-	-	1	1	-	10
Elbow Lake	1	2	3	10	2	1	3	2	1	2	1	1	1	2	1	33
Eveleth	-	2	2	3	2	3	2	2	2	1	-	2	2	2	-	25
Faribault	1	2	-	17	5	1	4	2	1	1	1	2	2	1	-	40
Glyndon	1	2	1	1	1	1	1	3	1	1	1	2	2	2	1	21
Granite Falls	1	1	1	5	5	2	2	.5	1	1	-	.5	.5	1	2	23.5
Harmony	1	2	3	3	3	1	2	1	2	1	1	2	1	2	2	27
Hill City	1	1	2	4	3	-	1	-	2	1	1	1	2	2	-	21
Hinckley	1	1	2	3	4	1	3	1	1	1	1	1	1	2	1	24
Howard Lake	1	.5	1	2.5	1	1	2	1.5	2	1.5	2	1	2	2	-	20
International Falls	1	2	3	2	4	1	4	2	2	1	1	2	-	4	1	30
Lanesboro	1	1	2	4	2	1	1	2	2	2	2	2	1	2	-	25
Mankato	1	1	1	6	3	1	2	2	2	1	1	1	1	4	1	28
McIntosh	1	-	1	8	2	1	1	1	.5	-	.5	1	1	1	1	20
Medford	.5	.5	.5	1.5	3	1	2	2	2	1	1	1	2	1	1	20
Milaca	1	2	2	-	-	1	2	-	-	-	-	-	-	-	-	8
Morgan	1	1	2	4	4	1	2	1	1	3	2	2	2	1	1	28

Schools	Introduction	History	Types	Breeds	Judging Age	Unsoundness	Feeding Costs	Feeding Work Horses	Feeding Mare	Feeding Colt	Care of Mare & foal	General Care	Diseases	Marketing	Total
Preston	2	2	4	6	5	1	2	-	-	-	1	1	1	-	25
Red Wing	1	3	4	10	3	2	3	-	1	-	1	1	-	-	30
St. Cloud	1	1	2	5	2	1	2	2	2	1	1	2	1	1	26
So. St. Paul 17-18	1	1	2	7	5	2	2	1	2	2	2	1	2	1	33
So. St. Paul 19-20	-	1	2	11	2	2	7	-	-	-	-	1	-	-	26
Two Harbors	2	2	2	5	1	1	3	1	1	1	1	1	3	-	25
Wadena	1	2	1	5	6	1	4	2	1	1	1	1	2	1	30
Warren	.5	1	.5	6	4	1	2	1	1	1	1	1	1	-	22
Walker	1	1	5	5	2	1	1	-	.5	.5	-	1	3	.5	22

Total 31	29	45	56	158	87	30	Age	66	Unsoundness	53.5	Feeding Costs	37	Feeding Work Horse	32.5	Feeding Mare	28	Feeding Colt	40	Care of Mare and foal	42.5	General Care	50.5	Diseases	6	185	Marketing	Total
Average	.9	1.3	1.8	5	2.8	1		2.1	5	1.1	1	.9	1.1	1	.9	1.2	1.3	1.6	1.3	1.6	1.6	.6	20.6				
Median	1	1	2	5	3	1		2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	24	
Mode	1	1	2	5	2	1		2	1	1	1	1	1	1	1	1	1	1	1	1	1	2	1	1	1	23	
Range	0	.5	0	.0	0	0		1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	
	2	4	5	17	6	1		7	7	2	3	2	2	2	2	2	2	2	2	5	4	4	2	2	2	40	

Here again too much time is given to breeds. Faribault has seventeen lessons out of forty for this division and an additional five for "judging". Five is the average.

Milaca shows but eight periods on the whole subject, which seems less than it warrants, particularly in Millelacs county.

TIME ALLOTMENT TABLE #11 (a)

The Number of Days Given to Each of the Sub-Topics under
Beef Cattle

Schools	Types	Breeds	Judging	Feeding	General Care	Management	Total
Albert Lea	.5	.5	2	3	1	2	9
Alexandria	1	2	2	1	1	1	8
Blue Earth	.5	3	6	4	2	1	16.5
Cannon Falls	1	4	3	3	2	1	14
Chatfield	1	3	2	3	3	3	15
Cokato	1	4	4	6	2	2	19
Deer River	1	2	3	3	3	3	15
Fairmont	1	3	4	4.5	1	1	14.5
Fosston	1	4	9	6	2	2	24
Grand Rapids	1	2	3	3	.5	.5	10
Hector	1	5	3	3	3	3	18
Jackson	1	1	3	2	1	1	9
Kasson	2	5	4	5	1	1	18
Madelia	2	3	4	5	6	6	26

Schools	Types	Breeds	Judging	Feeding	General Care	Management	Total
Mantorville	1	1	1	.5	.5	-	4
Montevideo	1	3	4	3	2	2	15
New Richland	1	1	1	1	1	1	6
Norwood Y.A.M.	-	3	2	2	1	1	9
Owatonna	1	3	3	2	3	3	14
Park Rapids	1	3	2	6	1	3	16
Pipestone	1	4	8	3	2	2	20
Renville	2	4	3	3	2	2	16
Sandstone	1	1	1	1	1	1	6
Thief River Falls 36	1	4	5	10	-	2	22
Thief River Falls 24	-	3	3	7	-	1	14
Virginia	2	3	4	5	2	2	18
Waseca	1	1	1	1	1	1	6
Total 27	28	75.5	90	96	44	48.5	
Average	1	2.8	3.3	3.5	1.6	1.8	14
Median	1	3	3	3	1	2	13
Mode	1	3	3	3	1	1	12
Range	0	.5	1	.5	0	0	6
	2	5	9	10	6	6	26

Fosston and Pipestone give nine and eight days respectively to Judging. This seems a good deal to devote to this topic. Thief River Falls gives half the time to Feeding.

The range in this subject is not greater than might be expected.

TIME ALLOTMENT TABLE #11 (b)

Schools	<u>Beef Cattle</u>						Total
	Types	Breeds	Judging	Feeding	General Care	Management	
Aitkin	4	4	4	6	1	1	20
Appleton	1	5	5	5	5	7	28
Austin	2	8	2	3	1	1	17
Bagley	1	2	4	5	3	5	20
Blackduck	1	2	1	4	3	2	13
Deephaven	1	1	-	1	1	1	5
Elbow Lake	-	5	3	3	1	2	14
Eveleth	2	3	2	4	5	2	18
Faribault	2	6	3	4	3	2	20
Glyndon	2	2	2	4	3	2	15
Granite Falls	2	5	3	2	2	1	15
Harmony	2	10	8	5	2	3	30
Hill City	1	4	-	3	1	-	9
Hinckley	1	3	3	4	2	3	16
Howard Lake	1	2	2	2	1	2	10
International Falls	2	2	4	4	1	2	15

Schools	Types	Breeds	Judging	Feeding	General Care	Management	Total
Lanesboro	3	5	3	4	6	5	26
Mankato	2	5	3	2	2	3	17
McIntosh	1	10	4	3	4	3	25
Medford	1	2	3	3	2	2	13
Milaca	1	2	3	1	1	-	8
Morgan	1	4	6	5	4	3	23
Preston	4	8	18	5	4	6	45
Red Wing	2	12	2	3	3	3	25
St. Cloud	2	6	3	2	2	-	15
So. St. Paul 17-18	2	6	8	2	2	3	25
So. St. Paul 19-20	1	9	10	2	1	-	23
Two Harbors	1	3	1	1	1	1	8
Wadena	2	4	4	2	3	2	17
Warren	1	8	4	2	2	1	18
Walker	3	3	1	.5	2	1.5	11
Westbrook	.5	3.5	2	4	.5	.5	11
Total 32	52.5	158.5	151	102.5	74.5	70	
Average	1.6	4.9	4.1	3.1	2.3	2.2	16.2
Median	1	4	3	3	2	2	15
Mode	1	2	3	2	1	2	11
Range	0	1	0	.5	.5	0	4
	4	12	18	6	6	7	45

Here again, the amount of time given to judging seems to be out of proportion to its value. Beef cattle judging is not particularly difficult compared with other stock judging. Yet two schools give ten and eighteen days to it. This is from two to nearly four weeks. The usual time is but three days.

TIME ALLOTMENT TABLE #12 (a)

The Number of Days Given to Each of the Sub-Topics under
Dual Purpose Cattle

School	Value	Type	Breeds	Judging	Feeding	Total
Alexandria	-	.5	.5	-	-	1
Cannon Falls	-	1	1	-	-	2
Deer River	1	-	2	1	1	5
Jackson	1	.5	.5	1	1	4
Kasson	1	1	1	2	1	6
Madelia	1	2	1	1	-	6
Mantorville	1	1	2	1	-	5
New Richland	1	1	1	-	-	3
Norwood Y.A.	-	-	2	-	1	3
Owatonna.	1	1	1	-	-	3
Pipestone	-	-	1	-	-	1
Renville	2	2	2	2	2	10
Sandstone	1	1	1	1	1	5
Thief River Falls 24	-	-	1	-	-	1

	Value	Type	Breeds	Judging	Feeding	Total
Totals 14	10	11	18	9	7	
Average	.7	.8	1.3	.7	.5	4
Median	1	1	1	0	0	3
Mode	1	1	1	0	0	3
Range	0 2	0 2	0 2	0 2	0 2	1 10

Dual-purpose cattle are treated separately by fourteen schools. These schools are located mostly in the southern parts of the state. Where but one period is allowed, it is devoted to breed study.

It is not clear why Renville should spend ten days on this subject.

TIME ALLOTMENT TABLE #12 (b)

Schools	<u>Dual Purpose Cattle</u>					Total
	Value	Type	Breeds	Judging	Feeding	
Aitkin	1	2	2	3	2	10
Austin	1	1	1	-	-	3
Bagley	2	1	2	3	2	10
Blackduck	1	1	1	-	-	3
Elbow Lake	1	-	3	-	1	5
Faribault	1	1	1	1	1	5
Glyndon	2	3	3	2	-	10
Granite Falls	2	1	1	1	-	5

Schools	Value	Type	Breeds	Judging	Feeding	Total
Harmony	1	1	1	1	1	5
Hill City	-	-	1	-	-	1
Hinckley	1	2	2	1	2	8
International Falls	-	2	1	-	-	3
Lanesboro	1	2	1	1	-	5
Mankato	1	1	1	1	1	5
McIntosh	1	-	2	-	-	3
Medford	1	1	2	3	2	9
Milaca	1	1	-	-	-	2
Morgan	2	1	2	2	4	11
Red Wing	-	2	2	1	-	5
St. Cloud	1	1	2	1	-	5
So. St. Paul 17-18	1	1	3	1	1	7
Wadena	1	1	1	1	-	4
Warren	.5	.5	2	1	1	5
Walker	1	2	1	1	-	5
Westbrook	-	.5	.5	-	-	1
Howard Lake	1	.5	.5	2	2	6
Total 26	25.5	29.5	38	27	20	
Average	1	1	1.5	1	.8	5.3
Median	1	1	1	1	0	4
Mode	1	1	1	1	0	4
Range	0	0	0	0	0	1
	2	3	3	3	4	11

The Sun & Smith - Hughes schools at Aitkin and Glyndon each give ten days to general purpose cattle. This is to be expected in this section of the state. Why Morgan, in Red Wood county, devotes eleven days to this subject is not so clear.

Here, as in the Smith - Hughes - Schools, the subject is not considered of enough importance to merit such attention. Only twenty-six out of forty-one schools report it.

TIME ALLOTMENT TABLE #15 (a)

The Number of Days Given to Each of the Sub-Topics under

Dairy Cattle

Schools	Introduction	Type	Breeds	Judging-Points	Judging-Age	Judging-Score Card	Judging-Practices	Feeds	Feeding Standards	Balanced Rations	Calf	Heifer	Bull	Care of Herd	Dairy Buildings	Diseases	Advanced Registry	Total
Albert Lea	1	2	3	1	-	1	3	.5	.5	2	2	1	1	1	5	1	1	51
Alexandria	-	.5	3	-	-	1	4	2	1	5	5	2	-	4	4	2	1	38.5
Blue Earth	1	-	2	4	-	-	-	1	.5	1	.5	.5	.5	1	1	1	1	18
Cannon Falls	.5	.5	3	1	.5	.5	5	3	1	3	2	1	1	2	1	1	-	28
Chatfield	1	2	4	1	-	1	3	3	3	4	3	1	1	3	2	3	2	43
Cokato	1	1	4	1	.5	.5	2	6	1	3	2	1	1	1	2	2	1	32
Deer River	1	1	3	1	1	1	4	1	1	3	2	2	1	2	2	2	2	30
Fairmont	.5	.5	45	1	.5	.5	2	2	1	1	2	1	1	2	1	2	.5	27
Fosston	1	1	7	2	1	1	2	2	1	3	3	3	2	2	2	2	1	39
Grand Rapids	1	1	4	1	1	1	4	2	1	3	3	2	2	2	2	3	1	34
Hector	1	1	10	2	1	1	3	2	2	5	2	1	2	2	3	3	2	43

Schools	Introduction	Types	Breeds	Judging-Points	Judging-Age	Judging-Score Card	Judging Practice	Feeds	Feeding Standards	Balanced Rations	Calf	Heifer	Bull	Care of Herd	Dairy Buildings	Diseases	Advanced Registry	Total
Jackson	1	1	4	2	1	2	5	2	1	2	1	1	1	1	3	3	1	32
Kasson	1	2	9	2	1	1	6	2	2	2	3	2	2	2	2	2	1	40
Kadelia	1	1	2	.5	.5	1	3	5	1	3	1	1	1	1	2	2	1	27
Mantorville	2	7	8	2	1	2	4	2	3	3	3	1	1	2	2	2	1	46
Montevideo	1	2	4	2	-	2	2	2	1	2	1	1	1	-	2	2	-	25
New Richland	1	2	4	2	1	1	3	3	1	4	1	1	1	1	2	2	1	31
Norwood Y.A.	1	-	10	2	-	2	4	6	1	3	2	2	1	2	1	4	1	42
Owatonna	1	1	6	1	1	1	5	2	2	2	1	1	1	1	2	1	1	28
Park Rapids	2	1	3	2	1	2	8	8	1	4	3	1	1	2	3	2	1	45
Pipestone	1	1	4	.5	.5	1	4	1	1	2	1	1	1	.5	1	1	.5	22
Renville	2	2	3	2	1	1	3	1	2	5	2	1	1	3	3	2	2	36
Sandstone	1	4	13	2	1	1	10	2	1	1	1	1	2	6	2	4	1	63
Thief River Falls 36	1	1	5	1	-	1	4	2	1	4	3	2	2	2	2	2	1	34
Thief River Falls 24	1	1	3	1	-	1	2	2	1	4	2	1	1	1	2	1	-	24
Virginia	1	-	8	1	-	1	5	2	3	2	1	1	1	8	2	2	-	38
Waseca	1	1	3	2	1	2	3	3	1	3	1	-	1	1	2	1	-	25
Totals 27	28	47.5	144	40	15.5	30.5	110	73.5	36	82	51.5	33.5	31.5	56.5	37.5	51	25	
Average	1	1.7	5.2	1.5	.5	1.1	4	2.7	1.3	3	1.9	1.2	1.1	2.1	1.4	1.8	.9	284
Median	1	1	4	1	.5	1	4	2	1	3	2	1	1	2	2	2	1	295
Mode	1	1	4	2	1	1	4	2	1	3	2	1	1	2	2	2	1	31
Range	0	0	2	0	0	0	0	.5	.5	1	.5	0	0	0	1	0	0	15
	2	7	13	4	1	2	10	8	3	6	3	3	2	8	5	5	2	63

Minnesota is a great dairy state. She ranks now first in butter production and near the top in value of other dairy products and dairy live stock. As the great northern section of the state, a natural clover country, is opened up, Minnesota may become the leading dairy state in the Union.

There is no type of farming more valuable in keeping up the fertility of the soil. Fertility maintenance is agriculture's greatest problem. For this reason if for no other, dairy farming must be encouraged. The boys who are in the Animal Husbandry classes today are the dairymen of tomorrow. With but few, if any, exceptions, the topic of dairying should be given a greater proportion of the time than any other topic in the Animal Husbandry course.

Of the twenty-seven Smith - Hughes schools reporting, twenty-three allow more time for Dairy Cattle than for any other topic. In addition to this some time is given to Milk. The amount of time spent upon Dairy Cattle ranges from fifteen to sixty-three days. The fifteen is unusually low, the next lowest number being twenty-two.

Sandstone spends thirteen days on Breeds and ten on Judging Practice, but this proportion is all right as a total of sixty-three days is given to the whole subject. As a rule a little more time should be spent upon the care of the Herd. An average of only two days is given to this, and in a Smith - Hughes department particularly, more attention should be given to it.

TIME ALLOTMENT TABLE # 13 (b)

Dairy Cattle

Schools	Introduction	Types	Breeds	Judging-Points	Judging-Age	Judging-Score Card	Judging Practice	Feeds	Feeding Standards	Balanced Rations	Calf	Heifer	Bull	Care of Herd	Dairy Buildings	Diseases	Advanced Registry	Total
Aitkin	1	2	2	2	1	1	2	2	2	3	.5	.5	.5	.5	1	1	2	24
Appleton	-	3	5	1	1	2	5	3	2	5	1	-	1	2	1	1	1	36
Austin	1	1	4	1	-	1	2	2	1	2	2	1	1	1	1	2	1	24
Bagley	1	1	2	2	1	2	2	2	2	3	2	1	1	2	2	2	2	30
Blackduck	1	1	2	2	1	2	4	5	1	5	3	1	1	8	2	2	1	42
Deephaven	1	2	3	3	-	2	2	-	-	-	5	-	-	-	1	1	-	20
Elbow Lake	1	1	5	2	-	2	2	2	2	5	1	1	1	1	2	3	-	31
Eveleth	-	2	2	-	2	2	2	2	2	-	-	-	-	-	2	2	-	18
Faribault	1	1	10	1	1	2	5	-	-	5	1	1	1	1	2	2	2	36
Glyndon	2	3	3	1	1	1	2	4	4	4	2	1	1	2	1	2	1	34
Granite Falls	1	2	5	2	1	1	2	2	2	1	2	2	2	1	2	2	1	31
Harmony	1	2	2	1	1	2	2	2	2	3	1	1	1	1	1	2	1	26
Hill City	1	2	6	8	-	2	2	5	2	4	1	2	1	1	3	-	-	40
Hinckley	2	3	3	4	1	2	2	5	5	3	2	1	1	2	3	3	2	44
Howard Lake	.5	.5	2	1	1	1	2	1	3	4	2	2	1	2	3	2	1	29
International Falls	4	3	4	4	1	2	-	3	3	18	3	3	2	1	5	3	1	55
Lanesboro	1	2	5	2	-	2	5	2	-	10	2	1	1	2	2	4	1	42
Mankato	1	2	5	2	1	1	3	2	1	8	1	1	1	1	2	2	1	33

Schools	Introduction	Types	Breeds	Judging-Points	Judging-Age	Judging-Score Card	Judging-Practice	Feeds	Feeding Standards	Balanced Rations	Calf	Heifer	Bull	Care of Herd	Dairy Buildings	Diseases	Advanced Registry	Total
McIntosh	1	1	8	1	1	1	1	2	1	4	2	1	1	1	2	2	1	31
Nedford	1	1	3	2	-	1	3	3	1	6	1	1	1	1	2	2	2	28
Milaca	2	2	3	2	-	2	20	2	2	6	4	1	3	2	2	4	2	63
Morgan	1	2	4	3	1	2	3	2	2	6	2	2	1	2	2	1	1	32
Preston	-	4	6	2	1	1	6	3	3	3	2	1	1	2	2	1	1	39
Red Wing	1	2	6	3	1	1	3	2	2	3	1	-	-	-	3	3	2	36
St. Cloud	1	2	6	4	1	1	2	2	1	2	1	1	1	1	1	2	1	30
So. St. Paul 17-18	1	2	3	2	-	4	10	4	2	10	4	2	1	2	1	3	1	27
So. St. Paul 19-20	1	1	9	-	1	1	2	1	1	3	-	-	1	1	-	1	1	23
Two Harbors	1	2	3	2	1	-	1	3	1	3	1	1	1	1	3	3	1	33
Wedens	5	5	5	5	5	1	5	3	1	4	1	1	1	2	2	2	2	26
Walker	1	3	3	2	5	5	3	2	1	2	1	1	1	1	3	5	-	28
Westbrook	-	-	2	-	-	-	2	2	1	1	1	1	1	1	1	1	-	14
Warren	1	1	6	3	1	1	3	2	2	7	1	1	1	2	1	1	1	26
Totals 32	30	56	148	66.6	25	46.6	112	80	55	127	59.6	33.6	32.6	50.6	53.5	52	64	
Average	1	1.8	4.6	2.1	.7	1.4	3.4	2.5	1.7	4	1.9	1	1	1.6	1.7	1.6	2	30.7
Median	1	2	5	2	1	1	2	2	2	4	1	1	1	1	2	2	2	32
Mode	1	2	2	2	1	1	2	2	2	3	1	1	1	1	2	2	2	31
Range	2-0	4-0	1-9	0-6	2-0	2-0	2-20	1-3	1-2	1-10	1-4	1-2	1-3	1-2	1-3	1-4	1-2	14
	20	56	148	66.6	25	46.6	112	80	55	127	59.6	33.6	32.6	50.6	53.5	52	64	63

This table is not remarkably different from #13 (a). Out of forty one schools reporting on Dairy Cattle, thirty-two give it more time than any other subject. The difference, however, is not always as great as it should be.

The sub-topics are grouped in the following order, that being given the most time, first; Breeds, Balanced Rations, Judging Practice, Feeds, Points in Judging, Advanced Registry, Diseases, Dairy Buildings, Calf, Types, Feeding Standards, Care of Herd, Score Card, Heifer, Bull, Introduction and Age. Grouping these somewhat differently we get the following average amount of time spent upon each group:

Types and Breeds	6.4 days
Judging	7.6 days
Feeding and Care	15.5 days
Dairy Buildings	1.9 days

This division is reasonable, though some time might be spared from the first three to devote to buildings and equipment.

TIME ALLOTMENT TABLE #14 (a)

The Number of Days Given to Each of the Sub-Topics under

Milk

Schools	Testing	Care	Records	Sanitation	Churning	Total
Albert Lea	10	4	1	.5	-	15.5
Alexandria	3	1	-	-	-	4
Blue Earth	2	.5	.5	.5	1	4.5
Cannon Falls	2	.5	.5	-	-	3
Chatfield	5	1	1	2	1	10
Cokato	2	1	.5	.5	1	5
Deer River	2	1	2	1	1	7
Fairmont	3	.5	.5	1	-	5
Fosston	1	3	1	1	1	7
Grand Rapids	2	1	1	1	1	6
Hector	1	1	1	2	-	5
Jackson	2	.5	.5	1	1	5
Kasson	4	1	1	1	1	8
Madelia	2	1	1	1	1	6
Mantorville	2	.5	1	.5	1	5
Montevideo	3	1	1	1	-	6
New Richland	4	1	1	1	1	8
Norwood Y.A.	4	1	1	1	-	7
Owatonna	2	1	1	1	-	5
Park Rapids	6	1	1	1	-	9

Schools	Testing	Care	Records	Sanitation	Churning	Total
Pipestone	3	.5	1	.5	1	6
Renville	2	2	3	1	2	10
Sandstone	2	1	1	1	1	6
Thief River Falls 36	4	.5	1	.5	-	6
Thief River Falls 24	2	.5	1	.5	-	4
Virginia*	3	3	1	3	3	13
Waseca	7	1	1	1	-	10
Total 27	90	31	26.5	25.5	18	
Average	3.3	1.1	1	1	6	7.1
Median	2	1	1	1	1	6
Mode	2	1	1	1	1	6
Range	1 10	.5 4	0 3	0 3	0 3	3 15.5

Ten days devoted to milk testing seems a good deal. However, it is an important matter and the time may be well spent.

* Forty-four lessons in all but cannot be classified under above headings.

TIME ALLOTMENT TABLE #14 (b)

Milk

Schools	Testing	Care	Records	Sanitation	Churning	Total
Aitkin	3	2	2	2	1	10
Appleton	2	1	1	2	-	6
Austin	2	1	1	1	1	6
Bagley	5	4	2	3	1	15
Blackduck	7	2	1.5	1.5	-	12
Deephaven	2	1	2	-	-	5
Elbow Lake	1	1	1	1	1	5
Eveleth	2	2	1	-	-	5
Faribault	1	.5	.5	.5	.5	3
Glyndon	4	2	2	2	3	13
Granite Falls	2	1	1	-	1	5
Harmony	2	1	2	2	1	8
Hill City	10	4	2	1	-	17
Howard Lake	3	2	2	2	1	10
International Falls	3	1	1	-	1	6
Lanesboro	2	1	1	1	-	5
Mankato	1	1	1	1	1	5
McIntosh	2	1	1	1	1	6
Medford	5	3	3	2	2	15
Milaca	3	-	2	1	-	6
Morgan	3	1	2	1	-	7

Schools	Testing	Care	Records	Sanitation	Churning	Total
Preston	2	-	1	2	-	5
Red Wing	6	4	4	4	2	20
St. Cloud	4	2	2	2	2	12
So. St. Paul 17-18	8	1	2	2	-	13
So. St. Paul 19-20	6	1	1	2	-	10
Two Harbors	5	1	2	2	-	10
Wadena	5	2	1	1	1	10
Warren	1	.5	.5	.5	1	3.5
Walker	4	3	1	1.5	.5	10
Westbrook	1	.5	.5	.5	.5	3
Total 31	107	47.5	47	42.5	22.5	
Average	3.5	1.5	1.5	1.4	.7	8.5
Median	3	1	1	1	1	7
Mode	2	1	1	2	1	7
Range	1	0	.5	0	0	3
	10	4	4	4	3	20

The testing of milk is one of the most important factors in securing increased milk and butter production. Although cow testing associations are rapidly being formed, they have their limitations, and every dairy man should be able to make the test himself. Boys who expect to farm should certainly receive enough instruction in testing so that they may do the work with accuracy.

The average amount of time spent on milk testing in the Non - Smith - Hughes schools is about seven days. If the work is well planned, this should be sufficient.

TIME ALLOTMENT TABLE #15 (a)

The Number of Days Given to Each of the Sub-Topics under

Bees

<u>Schools</u>	<u>Value</u>	<u>Care and Management</u>	<u>Total</u>
Blue Earth	1	1	2
Chatfield	1	4	5
Deer River	1	2	3
Fosston	1	3	4
Grand Rapids	1	2	3
Hector	1	4	5
Jackson	1	4	5
Madelia	1	1	2
Norwood Y.A.	1	1	2
Owatonna	1	1	2
Sandstone	1	7	8
Waseca	1	2	3
Total 12	12	32	
Average	1	2.7	3.7
Median	1	2	3
Mode	1	1	2
Range	-	1 7	2 8

TIME ALLOTMENT TABLE #15 (b)

Schools	<u>Bees</u>		Total
	Value	Care and Management	
Aitkin	2	3	5
Deephaven	2	13	15
Glyndon	2	3	5
Granite Falls	2	2	4
Harmony	2	3	5
Hinckley	2	3	5
Lanesboro	1	2	3
McIntosh	1	2	3
Medford	1	2	3
Milaca	-	1	1
Morgan	1	2	3
St. Cloud	1	7	8
So. St. Paul 17-18	1	3	4
So. St. Paul 19-20	1	9	10
Wadena	2	3	5
Walker	2	7	9
Total 16	23	65	
Average	1.5	4	5.5
Median	1	3	4
Mode	2	3	4
Range	0	1	1
	2	13	15

Not a great deal of time is spent upon the subject of bees. Although in the aggregate the honey produced is valued in thousands of dollars, the teaching of bee keeping has not found a place in the schools. There are probably two reasons for this. The average agricultural instructor knows very little about bees, and the average farmer cares little about them.

Deephaven and South St. Paul, both near the Twin cities, have given fifteen and ten days respectively to this subject. Both are also semi-suburban towns where small farms are found in considerable numbers. It will be noticed that but twenty-eight schools out of the sixty-eight reporting devoted any time at all to Bees.

TIME ALLOTMENT TABLE #16 (a)

The Number of Days Given to Each of the Sub-Topics under
General Breeding

Schools	Heredity	Selection	Herd book	Pedigree	Total
Albert Lea	.5	.5	1	.5	2.5
Blue Earth	.5	1.5	1	1	4
Cannon Falls	1	1	1	-	3
Chatfield	2	1	-	2	5
Deer River	1	2	1	1	5
Fairmont	1	1	.5	.5	3
Fosston	2	2	1	1	6
Grand Rapids	.5	.5	.5	.5	3
Hector	2	2	1	2	7
Jackson	2	2	1	2	7
Kasson	1	2	1	2	6
Mantorville	2	2	1	3	8
Montevideo	2	2	-	-	4
New Richland	1	1	1	1	4
Norwood Y.A.	1	1	1	1	4
Owatonna	1	-	-	1	2
Park Rapids	1	2	1	1	5
Pipestone	1	1	.5	.5	3
Renville	2	2	2	2	8
Sandstone	1	2	1	1	5

Schools	Heredity	Selection	Herd book	Pedigree	Total
Thief River Falls 36	3	1	-	1	5
Thief River Falls 24	3	1	-	1	5
Waseca	.5	.5	-	-	1
Total 23	32	31	16.5	25	
Average	1.4	1.2	.7	1	4.3
Median	1	1	1	1	4
Mode	1	2	1	1	5
Range	.5 3	0 2	0 2	0 3	1 8

TIME ALLOTMENT TABLE # 16 (b)

General Breeding

Schools	Heredity	Selection	Herd book	Pedigree	Total
Aitkin	5	5	4	6	20
Appleton	2	2	1	2	7
Austin	1	1	-	-	2
Bagley	5	2	2	1	10
Blackduck	2	2	-	1	5
Eveleth	2	2	2	-	6

Schools	Heredity	Selection	Herd book	Pedigree	Total
Glyndon	1	1	1	2	5
Granite Falls	1	2	1	1	5
Harmony	3	3	2	2	10
Hinckley	2	2	3	3	10
Howard Lake	1	2	1	1	5
Lanesboro	3	4	-	1	8
Mankato	1	1	1	1	4
McIntosh	1	1	1	2	5
Medford	2	4	2	1	9
Milaca	1	1	1	-	3
Morgan	2	3	2	2	9
Red Wing	4	3	1	2	10
St. Cloud	2	3	1	1	7
So. St. Paul 17-18	1	2	-	2	5
So. St. Paul 19-20	1	2	.5	.5	4
Two Harbors	2	2	1	2	7
Wadena	2	1	1	1	5
Warren	3	2	1	1	7
Walker	3	3	3	4	13

	Heredity	Selection	Herd book	Pedigree	Total
Total 25	53	56	32.5	39.5	
Average	2	2.2	1.3	1.5	7
Median	2	2	1	1	6
Mode	2	2	1	1	6
Range	1	1	0	0	2
	5	5	4	6	20

The subject of Breeding may be divided into two classes, special and general. The first refers to the problems of each type of livestock or of each breed and should be treated under these headings. General breeding, however, might well be given some consideration. Especially is this true of such universal subjects as heredity, selection and pedigrees.

The day of scrub stock is passing. Back of every individual must be breeding. Through selection and intelligent mating only, can improvement take place.

Twenty-three out of the twenty-seven Smith - Hughes schools recognize this importance and devote an average of over four days to the topic. Only twenty-four of the Non - Smith - Hughes schools report this topic, giving it an average of seven days. The balance of the schools probably include it under one of the classes of stock.

EQUIPMENT TABLE # 17 (a)
 EQUIPMENT OWNED BY THE SCHOOL
 (An "x" indicates ownership)

Schools	Babcock tester	Cream Separator	Milk Scales	Lactometer	Butter Worker	Churn	Sediment Tester	Milking Machine	Building Plans	Mech. Drawing Set.	Drawing Boards	Rope	Maps	Charts	Lantern & Slides	Animal Pictures	A. H. Score Cards	Agri. Magazines	A. H. Bulletins	Reference books	Incubator	Feed Hopper	Poultry Waterer	Harness & Parts	Model of Hoof	Feed Samples	Chemicals	Sample Bottles	Brooder	Cholera Outfit	Cliv. Thermometer	Ice Cream Freezer	Sample Silos	Nov. Picture Machine	Hog Capsule Outfit	Milk Fever Outfit	Medicines	Test Plugs	Trocar and Canula	Caponizing Outfit	Cream Balance	Poultry Trap Nest	Dairy Thermometer				
Albert Lea	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Alexandria	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Blue Earth	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Cannon Falls	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Chatfield	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Cokato	x	x	x	x	x	x			x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Deer River	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Fairmont	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Fosston	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Grand Rapids	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Hector	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Jackson	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Kasson	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Madelia	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Mantorville	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Montevideo	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
New Richland	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Norwood Y.A.	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Owatonna	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Park Rapids	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Pipestone	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Renville	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Sandstone	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Sauk Center	x	x	x	x	x				x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Thief River Falls	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Virginia *	x	x	x	x	x	x			x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Waseca	x	x	x	x					x	x	x	x	x		x	x	x	x	x	x						x	x	x																			
Total	27	23	21	3	4	7	0	19	16	17	26	19	24	24	26	27	27	27	27	12	7	4	0	1	22	27	25	2	1	3	2	1	1	1	3	1	1	1	1	1	1	1	1	1	1		

*Also a large assortment of material, including grain supplies and creamery equipment.

This table shows quite clearly the equipment which is most frequently owned by the Smith - Hughes schools. Of the twenty-seven schools reporting, all owned the following material: Babcock tester, A. H. Score cards, Agricultural magazines, A. H. bulletins, reference books and chemicals; twenty-one to twenty-six owned - milk scales, lactometer, rops, charts, lantern and slides, animal pictures, feed samples and sample bottles. The next in order of frequency are building plans, mechanical drawing sets, drawing boards and maps.

In addition to the equipment specified in the questionnaire, fifteen items were listed by the schools. Chemical thermometers and milk fever outfits have been purchased by several

EQUIPMENT TABLE #17 (b)

Equipment owned by the School

(An "x" indicates ownership)

Schools	Babcock Tester	Separator	M. Scales	Lact.	Butter Marker	Churn	Sedester	Milk Mach	Plans	MechDrSet	Draw Brds	Rope	Maps	Charts	Lantern & Slides	Animal Pictures	A. H. Score Cards	Aggr. Magazines	A. H. Bulletins	Reference Books	Incubator	Feed Hopper	Foultry Waterer	Harness & Parts	Model of Hoof	Feed Samples	Chemicals	Sample Bottles	Brooder	
Aitkin	x		x							x	x	x	x	x		x			x	x						x	x	x		
Appleton	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Austin	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Bagley	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Blackduck	x		x		x					x	x	x	x	x		x			x	x	x						x	x	x	
Barnum	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Brewster	x		x							x	x	x	x	x		x			x	x	x		x				x	x	x	
Deephaven	x		x		x					x	x	x	x	x		x			x	x	x						x	x	x	
Elbow Lake	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Eveleth	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Faribault	x	x								x	x	x	x	x		x			x	x	x						x	x	x	
Fisher	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Glyndon	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Granite Falls	x		x		x					x	x	x	x	x		x			x	x	x			x			x	x	x	
Harmony	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Hill City	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Hinckley	x	x								x	x	x	x	x		x			x	x	x						x	x	x	
Howard Lake	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Hutchinson	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
International Falls	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Lanesboro	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Le Sueur	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Mankato	x	x								x	x	x	x	x		x			x	x	x						x	x	x	
McIntosh	x	x			x					x	x	x	x	x		x			x	x	x		x				x	x	x	
Medford	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Melrose	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Milaca	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Montgomery	x		x		x					x	x	x	x	x		x			x	x	x						x	x	x	
Morgan	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Northfield	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Pequot	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Preston	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Red Wing	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Round Lake	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
St. Cloud	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
So. St. Paul 17-18	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
So. St. Paul 19-20	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Two Harbors	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Wadena	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Warren	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Walker	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Westbrook	x		x							x	x	x	x	x		x			x	x	x						x	x	x	
Total 42	42	4	24	35	5	10	4	0	26	20	24	25	20	28	23	35	37	41	39	42	18	6	1	1	5	28	34	35	1	

The Non - Smith - Hughes schools show the same frequency in equipment as the Smith - Hughes, but not the variety. Only one item, a brooder, was added to the suggested list. Those articles showing the highest frequency are Babcock tester, reference books, Agricultural magazines, Animal Husbandry bulletins, Animal Husbandry score cards, sample bottles, animal pictures, lactometer, feed samples and charts.

South St. Paul, for which figures were secured for two years, shows no improvement since 1917. It would be expected that an increase in the amount of equipment would have occurred in each year. Hill City, Melrose and Two Harbors seem somewhat short in numbers compared with the other schools.

EQUIPMENT TABLE # 18 (a)

EQUIPMENT BORROWED BY THE SCHOOL
(An "x" indicates equipment borrowed)

	Babcock Tester	Cream Separator	Milk Scales	Lactometer	Butter Worker	Churn	Sediment Tester	Milking Machine	Building Plan	Mech. Drawing Set	Drawing Boards	Rope	Maps	Charts	Lantern & Slides	Animal Pictures	A. H. Score Cards	Agr. Magazines	A. H. Bulletins	Reference Books	Incubator	Feed Hopper	Poultry Waterer	Harness & Parts	Model of Hoof	Feed Samples	Chemicals	Sample Bottles	Films	Barn Equipment		
Alexandria		x			x	x		x		x	x										x	x	x							x		
Blue Earth		x								x	x										x	x	x									
Cannon Falls		x													x																	
Chatfield								x							x								x	x								
Cokato		x				x		x							x																	
Deer River		x								x	x											x										
Fairmont		x								x																						
Fosston		x			x			x					x		x		x	x	x	x	x	x	x			x						
Hector		x			x	x	x	x	x				x	x	x	x				x	x	x										
Jackson																																
Madelia		x			x	x		x	x						x						x	x										
Mantorville		x			x	x									x																	
Montevideo		x													x							x	x	x			x					
New Richland								x												x												
Owatonna									x																							
Park Rapids																																
Pipestone		x				x															x			x								
Renville		x			x	x	x	x	x																							
Sandstone		x				x			x																							
Sauk Center		x						x	x																							
Thief River Falls		x	x					x	x	x	x																					
Virginia						x															x	x	x									
Waseca		x				x		x																								
Total 33	0	18	1	0	6	9	2	10	6	5	4	0	1	2	14	1	0	1	1	3	7	6	5	3	0	2	0	0	0	0	1	

The same list was submitted to be checked for borrowed equipment. The most usual item borrowed is a cream separator. Several companies will loan these for the advertising value. Eighteen out of the twenty-three schools have them, ten borrow milking machines and thirteen lantern and slides or merely the slides.

Hector borrows more than any other school, supplementing the large equipment which it owns. It seems strange that reference books should be borrowed, but in two of the three cases, the books belong to the instructor.

More advantage should be taken of borrowing, particularly in use of material obtainable from hardware stores, harness shops, feed stores, International Harvester Company and the University of Minnesota

EQUIPMENT TABLE #18 (b)

EQUIPMENT BORROWED BY THE SCHOOL

(An "x" indicates equipment borrowed)

	Babcock Tester	Cream Separator	Milk Scales	Lactometer	Butter Worker	Churn	Sediment Tester	Milking Machine	Building Plan	Mech. Drawing Set	Drawing Boards	Rope	Maps	Charts	Lantern & Slides	Animal Pictures	A. H. Score Cards	Agr. Magazines	A. H. Bulletins	Reference Books	Incubator	Feed Hopper	Poultry Waterer	Harness & Parts	Model of Hoof	Feed Samples	Chemicals	Sample Bottles	Films	Barn Equipment
Aitkin			x			x		x	x	x		x	x	x	x	x	x	x	x	x						x				
Appleton															x	x														
Austin												x			x															
Bagley		x	x						x							x		x						x						
Deephaven														x	x															
Eveleth			x											x																
Faribault		x																			x	x								
Fisher		x							x	x															x					
Glyndon		x							x			x						x									x			
Granite Falls		x								x	x																			
Harmony		x				x		x																	x					
Hinckley					x	x								x	x															
Howard Lake		x													x				x											
Hutchinson		x													x															
International Falls		x																		x										
Mankato					x	x		x												x						x				
Medford	x	x	x		x	x			x	x		x			x				x							x				
Melrose	x								x																					
Milaca		x																			x									
Montgomery		x																			x									
Pequot														x																
Preston																														
Red Wing		x															x	x	x			x	x							
Round Lake		x										x			x														x	
St. Cloud																					x									
South St. Paul 17/18		x																												
South St. Paul 19/20																														
Wadena										x																				
Walker														x	x															
Total	2	15	4	0	4	5	0	3	6	5	1	5	1	8	13	3	2	4	4	4	6	2	4	5	2	3	1	1	1	0

With the Non - Smith - Hughes schools as with the other type the equipment most frequently borrowed is a cream separator, lantern slides and charts. Milking machines are not brought before the class enough. It makes little difference whether or not they will eventually take the place of hand milking, they are worthy of attention.

The time has gone by when an agricultural department finds it necessary to fill the rooms with every imaginable farm appliance. There are several reasons for this. These things are expensive, may rapidly become out of date and more time is available for visits to farms and dealers.

Live stock might be classed as equipment. None of the schools replying to the questionnaire show ownership of animals. If asked if live stock is borrowed, the answer would undoubtedly be "Yes" in all cases. In a few places some years ago, departments owned some stock, at least during the school year. This was usually poultry. The plan was tried by the writer in 1917 at Central High School, Minneapolis. A company was formed among the boys of the Animal Husbandry class, stock selling for fifty cents a share. The members of the Agricultural Shop class erected a carefully planned poultry house, made concrete posts and put up the fence. Chickens of various breeds were selected and purchased. The boys fed and cared for the chickens and kept records on production. The venture paid returns, each boy receiving back principle and interest.

The birds were used in teaching the principles of feeding, digestion, sanitation and selection. They were easily handled and taken into the class room. Difficulties came about

in apportioning the work, at first every boy wanted it, and later only a few. School was over for the day at three and boys could not return to feed and shut up the chickens. Consequently the larger part of the care devolved upon the instructor and the boys received no benefit.

In consequence of this experience and the like experience of others, it may be stated definitely that the school should not own live stock. Stables and near by farms are better places for the study of the animals.

Untabulated Material

Several questions asked in the blank sent out have not been developed in this thesis. Some explanation of this should be made.

Questions 4 and 5 in regard to length of period were asked so that a comparison might more accurately be made relative to time allotment. In practically every case, the single period is either forty or forty-five minutes long. In the Smith - Hughes schools, another period is used for supervised study. With the Non - Smith - Hughes schools the study period is not always held under the control of the agricultural instructor but the student studies during a vacant period or at home. No table has been made of this material for all schools are found to be on the same basis as regards the amount of time spent per day.

Question 7 is ambiguous and has been variously answered. In the majority of the returns, the replies indicate that no period during the week is set aside as a definite laboratory hour, but that recitation and laboratory are mixed and often

indistinguishable. Nothing would be gained by tabulating replies where the question might be easily misinterpreted.

Question 8 in regard to arrangements for field trips was so variously answered that it would be impossible to compile an understandable table. Various schemes were carried out. Afternoons and Saturdays have to be used in many places. Where distances are short, double periods are used. Where trips are taken which interfere with other work, the other work must be made up. Often where the Animal Husbandry work is on the program either the first or last periods, time may be used before or after school, together with the regular school periods. In Smith Hughes departments it is usually easier to arrange for trips, in as much as the boys are there primarily for the agricultural work.

Questions 201, 202 and 203 were included in an attempt to evaluate the teaching of Animal Husbandry by its product. Before sending out the questionnaire an attempt was made to get some definite data in regard to boys who had left school after having had a course in Animal Husbandry. None was secured.

In the majority of the replies, these questions (see the appendix) were answered in the affirmative. The general opinion seems to be, at least with the instructors, that the teaching of Animal Husbandry is of value to the community and of help to the boys. This is no more than would be expected. Many instances of live stock improvement and of the interest of boys are given. The difficulty is that there are so many influences in the life of a boy, that it is almost impossible to say that his work in Animal Husbandry brought about any certain results.

Discussion of Tables

No attempt has been made to discuss in full the points brought out in each of the preceding tables ----- only those that are most striking have been mentioned and even these have not been dealt with completely.

Part II has presented conditions in regard to Content, Time Allotment and Equipment as they are found in the Smith - Hughes and Non - Smith - Hughes schools of Minnesota. Part III will consist of further comment upon these conditions and draw some conclusions from the same.

PART III

DISCUSSION AND CONCLUSIONS

Aims

A course in Animal Husbandry should accomplish several ends. It should interest the students in agriculture and particularly in livestock farming. It should familiarize the boys with the most advanced methods in breeding, feeding, housing and caring for farm animals. It should give them an historic background and a present day knowledge of the most important breeds of stock. It should, thru the influence of the boys, result in improved livestock in the community and greater interest in its breeding. The work of the livestock breeder should be shown in all its dignity and importance and a realization of the value of this industry impressed upon the students. Boys should appreciate the problems of agriculture whether they actually become farmers or not.

There has been much discussion among economists as to the proper balance between the urban and the rural population. Many have maintained that the problem of increased production is not that of greater number of workers or farms, but more efficient methods of production, so that the same number of workers will be able to grow more per unit. Others have thought that the proportion of the rural population to the urban must increase, that more farms and more farmers are all that is necessary to meet the demands of increased total population.

As in many great problems, the middle course seems the most likely. Production per worker must be increased thru efficiency by use of machines, but there must also be more workers. Production per capita under economical conditions has nearly reached

its limits. The solution lies in smaller farms, intensive production, new land brought into arable condition and new farmers properly trained. The Animal Husbandry course thus has a double duty--to interest the boys and to make them good farmers. It is quite probable that emphasis on either of these two will result in the other being satisfactorily taken care of. Consequently, more attention is usually centered in the matter of giving a practical knowledge of farming than in the matter of interest. This latter is merely incidental.

In outlining a course in Animal Husbandry, the above aims must be kept in mind. There should be no difference in the treatment of this subject in Smith-Hughes and Non Smith-Hughes schools. A boy will not be "permanently injured" if he has had a thorough agricultural training and later decides to become a banker. He may be a better banker, physician, bricklayer or lawyer because of his knowledge of farming. The course is vocational, in the broad sense at least, in that it will help him in his life occupation, even tho this is not farming.

Length of Course.

Whether or not six or nine months is considered a school year is an important question. At present in Minnesota, twelve of the Smith-Hughes schools and thirty-three of the Non Smith-Hughes schools reported nine months (thirty-six weeks) courses. The balance were for twenty-four weeks. This means that four more

than half of the Smith-Hughes schools have six months courses. This is due, no doubt, to the State Board for Vocational Education's interpretation of "Project Work" as one-half year.

The six months plan has several objectionable features, the chief one being that should a boy decide to continue his education at a University, he is lacking in entrance credits and must spend some years more in high school. Students in these courses are more or less set off from the rest of the school and its activities and the friendships which should be cemented during school days between the townsmen and the farmers of the next generation are not possible. School administration is made difficult, for if given special work, the agricultural students cannot be mixed with other classes, more teaching periods are necessary, more conflicts are encountered and more teachers required.

There seems to be little valid reason why these vocational students should not attend school during the regular nine months session. The larger number of the boys doing project work live at home and could readily meet the half time requirement by putting in more hours during the three summer months and after school hours, spring and fall. If, upon taking a nine months' course, the boy decides to attend college, he can enter the regular classes during his Junior or Senior year and thus meet the entrance requirements. The agricultural students feel more a part of the school and take part in all activities on an equal footing with the others.

The writer consequently advocates a nine months' course in Animal Husbandry for all schools. It is not just in any way to interfere with the opportunities of a group for securing higher education. In the six months' courses it is quite clear that

opportunities for advancement to the higher educational institutions are lacking.

Place in Agricultural Course

The place of Animal Husbandry in the Agricultural Course is clearly indicated in Tables Number 2(a) and Number 2(b). In almost all cases it comes in the second year, following Field Crops. This is undoubtedly the proper position, for it should appear early enough so that students may study it before leaving school. In small schools it is often alternated with Field Crops, only one being offered each year. Logically crops should precede animals and most schools have found this to be the best order .

Content

In the choice of subjects to be included in the Animal Husbandry course, the whole field should be covered. It is not sufficient that the students be given full instruction in the class of stock which is the staple product of a community. It must be kept in mind that large numbers of these boys will locate in other sections of the country where an entirely different kind of livestock may be important.

There are six prominent varieties of farm animals, horses, (and mules), dairy cattle, swine, beef cattle, sheep and poultry. All of these should certainly find a place in the course. Dual purpose cattle and bees should in most cases be included, usually however, in only a general way.

The general phases of breeding and feeding should also

have a portion of the time. Special points under these topics can be presented more clearly if a foundation is first laid down by a treatment of the broader and more universal aspects.

Time Allotment

The amount of time devoted to each one of these main divisions should be allotted on the basis of its value and importance in the community. For example, the dairy cow is of the greatest value in Minnesota now and potentially, and as far as the state is concerned, should be accorded the most time. Potentially, sheep are important, particularly in the out-over regions and should be given more attention than their actual value seems to warrant.

If the criteria for determining the time to be spent on each of these topics is the needs of the community, some means must be found to determine these needs. A careful farm survey is of greatest help. This should be made by the instructor and carefully analyzed. Other sources of information relative to needs are local bankers, business men, county agents, and good farmers and statistical reports of State and Federal Governments.

Order of Presentation

After the topical emphasis has been decided upon, it is necessary to consider the order of presentation of these topics. There are three sequences which may be considered, seasonal, psychological and practical. These sequences overlap somewhat.

If a seasonal sequence were followed, each class of animals would be studied during the time of year when it was most

convenient to work with or when there was the most to be learned about it. This might be considered practical and logical as well. However, from the practical standpoint, it is hard to discover a season of the year when one class of stock demands more attention than any other. Also, the actual dealing with the animals is better left to summer and project work. For studying principles and theories, it is not so important that the class be in actual contact with the animal at all times.

A psychological sequence is one which follows the workings of the boy's mind. Preceding from the known to the unknown, from the simple to the complex would be such an order. By a practical sequence is meant following an order that fits in with the most saving of time and energy and with the objects to be attained.

It seems that the most sensible sequence to follow is that of a combination of the last two. We must not neglect the psychological and we cannot neglect the practical. The two will combine readily. For example, both poultry and horses are familiar objects to most boys. Most boys have had something to do with one or the other. Both are readily obtainable for study. It seems then, that the thing to do is to start the Animal Husbandry course with one or the other of these subjects. Another practical point enters here, however, and that is the matter of the project in the Smith-Hughes schools. Normally, the course should start with the subject with which the most of the boys are going to deal during the summer. This will give opportunity for study and development thruout the year.

Not considering the project, however, the sequence of

topics should ordinarily follow this order: Introduction, Poultry, Feeds and Feeding, Beef Cattle, Dual-purpose Cattle, Breeding, Dairy Cattle, Milk, Swine, Sheep and Horses. No time is allowed for the subject Veterinary, as this may best be treated under each class of stock. If it is more desirable to have Poultry come in the spring, Horses may be studied first.

It must be clearly understood that this sequence is merely suggestive and must be altered to suit conditions. In general it conforms with the practice in the state as shown in Summary Tables Number 4(a) and Number 4(b).

Sub-Topics

It should not be necessary to discuss in detail the matter of sequence and time allotment for the sub-topics under each of the main topics listed above. As stated before, too much time is usually devoted to breed study in proportion to that given to care and management. The sub-topics studied should cover the field and emphasis be placed where most needed. For example, if scrub stock is too common, much time should be spent on the value and building up of a pure bred herd. The order of presentation most common is to take up breed study first, following in order with judging, feeding and care and management. This is practical but should not be adhered to dogmatically. The subject of marketing is not given enough attention. It may well be considered in the Animal Husbandry course, for many boys will not remain in school for the work in Farm Management.

The table summaries show in most cases sound judgment

in time allotment. Where ranges are extreme, a good reason may be readily discovered.

Equipment

The equipment which is used in teaching Animal Husbandry should represent actual needs. Nothing "fancy" should be used, but only the practical. Only that which has actual teaching value should be allowed to take up space. A small amount of material used is of greater worth than a large amount dusty.

There is not enough borrowing of charts and lantern slides. These are invaluable adjuncts to the teaching of Animal Husbandry, and should be used. The University of Minnesota, the International Harvester Company, Armour and Company and dozens of other institutions will gladly furnish charts, lantern slides and even moving picture films.

A "standard equipment" is suggested under the next section of the thesis.

CONCLUSIONS

1. The aim of the Animal Husbandry course should be of a vocational nature, that is, to prepare boys for the business of farming.
2. The length of the course should be, except in unusual cases, nine months.
3. Animal Husbandry should be taught in the second year of the Agricultural Course.
4. The following subjects should be studied: Horses, dairy cattle and milk, swine, beef cattle, sheep, poultry, breeding, feeding and probably dual-purpose cattle and bees.
5. The time allotted to each subject should be based upon its real and potential value in the community, in other words, upon the needs of the district.
6. The order of presentation should be a combination of the psychological and the practical. The suggested order is as follows: Either poultry or horses first, followed by feeds and feeding, beef cattle, dual-purpose cattle, breeding, dairy cattle, milk, swine and sheep.
7. Too much time is given to breed study in proportion to that spent on care and management.

8. Not enough charts and lantern slides are borrowed.

9. A "standard equipment" should consist of the following items:

Babcock tester and glassware

Milk scales

Lactometer

Rope

Maps

Charts

Lantern (a few standard slides)

Animal pictures

Animal Husbandry score cards

Agricultural magazines

Animal Husbandry bulletins

Reference books

Feed samples

Chemicals

Sample bottles

Building plans

Mechanical drawing sets

P A R T IV

APPENDIX

The Questionnaire

The following questionnaire was sent to each of the 108 schools in the state which was teaching Agriculture, with the request that it be filled out and returned.

Questionnaire
on
Animal Husbandry

- Name
- Present teaching address
- Town on which answers are based.
- Calendar year on which answers are based
1. Will your answers be based on Smith Hughes work?
2. Will your answers be based on Non Smith Hughes work?
3. How many weeks do you give to Animal Husbandry?
4. How many minutes per week given to An. Husb.?
5. How long is a single period?
6. Fill in below the agricultural subject taken each year.
Fresh.SophJr.Sr.
7. Do you have definite time for Laboratory work?
(As distinct from class work)
8. What arrangements do you make for field trips for judging, etc?
(During regular class periods, after school, Saturdays, etc.
Conflicts with other classes)
9. Check below all types of live stock well represented in your
community, numbering 1, 2, 3, 4, etc. in order of importance.
General Diversified Farming

Emphasizing:

- Horses.Beef Cattle.Hogs.Sheep.
- Dairy Cattle.Poultry.Bees.

10. After each one of the following topics place a figure indicating the number of DAYS which are spent upon each topic. Total
Days

GENERAL INTRODUCTION TO A.H. ^o --Relation to agriculture.....	. . . .
POULTRY ^o	
Introduction.....types.....breeds.....judging.....	. . . .
Eggs.....Incubation.....brooding.....feeding.....	. . . .
Houses.....equipment.....care.....marketing.....	. . . .
FEEDS & BEEDING ^o --Composition of feeds.....digestion.....standards..	
SWINE ^o	
Introduction.....types.....breeds.....judging.....	. . . .
Feeding-feeds.....breeding herd.....pigs.....fattening....	. . . .
Diseases.....houses.....equipment.....care.....marketing..	. . . .
SHEEP ^o	
Introduction.....types.....breeds.....judging.....	. . . .
Feeding.....care.....diseases.....marketing.....	. . . .
HORSES ^o	
Introduction.....history.....types.....breeds.....	. . . .
Judging.....age.....unsoundness.....	. . . .
Feeding-costs.....work horses.....mare.....colt.....	. . . .
Care of mare & foal....general care....diseases....marketing .	. . . .
BEEF CATTLE ^o	
Types.....breeds.....judging.....	. . . .
Feeding.....general care.....management.....	. . . .
DUAL PURPOSE CATTLE ^o -Value.....types.....breeds...judging...feeding.	. . . .
DAIRY CATTLE ^o	
Introduction.....types.....breeds.....	. . . .
Judging-points.....age.....score card.....practice.....	. . . .
Feeding-feeds.....standards.....balanced rations.....	. . . .
Care & management of calf.....heifer.....bull.....herd....	. . . .
Dairy buildings.....diseases.....advanced registry.....	. . . .
MILK ^o -Testing....care....records....sanitation....churning..	. . . .
BEES ^o -Value.....care & management.....	
GENERAL BREEDING ^o - Heredity....selection....herdbook....pedigrees.	
^o List on the back of this sheet topics not mentioned above and note	
<u>days spent on each.</u>	

11. Number the divisions listed below in the order in which you present them in your animal husbandry course.

Horses.....Beef Cattle.....Dairy Cattle.....Swine.....Sheep.....
Poultry.....Feeds & Feeding....Breeding....Veterinary....Bees...

101. Does the department own any live stock?If so, what? . . .

102. Check on the list below
each piece of equipment used
in A.H. which is owned by the School.

Babcock tester & glassware

Cream separator

Milk scales

Lactometer

Butter worker

Churn

Sediment tester

Milking machine

Building plans

Mech. Drawing set

Drawing boards

Rope

Maps

Charts

Lantern & slides

Animal pictures

A.H. score cards

A.H. Bulletins

Agr. Magazines

Reference books

Incubator

Feed hopper

Poultry waterer

Harness & parts

Model of hoof

Feed samples

Chemicals

Sample bottles
(Add on the back of this sheet
additional materials owned but
not included in this list)

103. Check on this list equipment
which you use in A.H. course but
is not owned by the School.
Material borrowed should be
checked in this list.

Babcock tester & glassware

Cream separator

Milk scales

Lactometer

Butter worker

Churn

Sediment tester

Milking machine

Building plans

Mech. Drawing set

Drawing boards

Rope

Maps

Charts

Lantern & slides

Animal pictures

A.H. score cards

Agr. Magazines

A.H. Bulletins

Reference books

Incubator

Feed hopper

Poultry waterer

Harness & parts

Model of hoof

Feed samples

Chemicals

Sample bottles

(Add on the back other items of
equipment which you borrow for use.)

201. Do you believe that the teaching of A.H. has improved the character of live stock in the community?If so, give specific examples below.

202. Do you believe that the teaching of A.H.in high school has influenced boys to stay on the farm? . . . Give some examples below.

203. Is the A.H.taught in high school of value in interesting boys in live stock and helping them to make good? . . . Give specific Examples.

(Use back of this sheet for above questions if necessary.)

TEXT BOOK ANALYSIS

An Analysis of Plumb's and Harper's Texts on Animal Husbandry
With reference to their value for use in the
Secondary Schools of Minnesota

The only two texts which are at all usable for the teaching of Animal Husbandry in the Secondary Schools of Minnesota are "Beginnings in Animal Husbandry" by C.S.Plumb and "Animal Husbandry for Schools" written by M.W.Harper.

In many schools, text books are used to a considerable extent in the Animal Husbandry course. Contrary to the custom of some years ago, however, the course governs the text book more, and the text book does not govern the course. In order to aid in the selection of the texts already on the market and to bring out points to be considered in choosing the book, this analysis has been made and included in the thesis.

It is unquestionably true that these texts were written with the idea that they might function over a wide range of territory where live stock conditions were more or less varied. This means that neither text was written with Minnesota conditions only, in mind. It is not at all probable that a book dealing with such a restricted field (comparatively) would be compiled on the basis of the needs of a single state. This study has been made, however, to ascertain, if possible, which book more nearly meets the requirements of Minnesota conditions.

It will be noted that the following tables are of two sorts-- Tables 1,2,4, and 5 are mainly quantitative and Tables 3 and 6 together with the Graph of Table 3 are qualitative.

TABLE NUMBER 1

Total Space Allotment by Pages and Percentage in
Plumb's and Harper's texts on Animal Husbandry.

Classes of Stock and Sub-Topics	Number of Pages		Percentage of Total Pages	
	Plumb	Harper	Plumb	Harper
Horses	58	84	15.24	24.49
Breeds	23	31	6.04	9.04
Judging	35	21	9.20	6.12
Feeding		10		2.91
Care & Mgt.		18		5.24
Breeding		4		1.16
Cattle	51	91	13.56	26.56
Breeds	28	26	7.44	7.29
Judging	23	14	6.12	4.08
Feeding		26		7.58
Care & Mgt.		24		6.99
Breeding		1		.29
Sheep	38	61	10.10	17.78
Breeds	25	26	6.70	7.29
Judging	13	10	3.40	2.91
Feeding		14		4.08
Care & Mgt.		8		2.32
Breeding		3		.87
Swine	27	47	7.18	13.70
Breeds	15	17	3.99	4.95
Judging	12	9	3.19	2.61
Feeding		11		3.19
Care & Mgt.		6		1.74
Breeding		4		1.16

Classes of Stock and Sub-Topics	Number of Pages		Percentage of Total Pages	
	Plumb	Harper	Plumb	Harper
	Poultry	62	43	16.57	12.53
Breeds	15	15	3.99	4.35
Judging	9	6	2.48	1.74
Feeding	14	10	3.72	2.91
Care & Mgt.	24	11	6.38	3.19
Breeding		1		.29
General Feeding	56	17	14.89	4.95
General Breeding	36		9.58	
General Care	12		3.19	
General Judging	24		6.38	
Importance of Stock	12		3.19	
TOTAL	376	343	100 /	100 /

/ Approximately--calculations carried out two decimals only.

Table 1-- This table is largely quantitative in character. The column of "percentages" is of course the most significant due to the variance in total number of pages. This table also brings out the difference between the two books in the manner of arrangement of subject matter. It will be noted that Harper unifies the subject matter under "Classes of Live Stock", while Plumb presents the material in a different form-- That is, Harper first discusses Horses completely, then passes on to Cattle, Sheep, Swine and Poultry--Plumb takes up Horses first but only treats two phases of the subject, breeds and judging; he then passes on to other classes of stock, taking up the other topics in a general way. This table should be studied in connection with Table 3, where the "complete percentage" allowed for classes of stock is given.

TABLE NUMBER 2

Space Allotment by Pages and Percentage in
Plumb's and Harper's Texts on Animal Husbandry on Topical Basis.

Topics	Number of pages		Percent Total pages	
	Plumb	Harper	Plumb	Harper
Breeds	106	115	28.16	32.92
Judging	116	60	30.77	17.46
Feeding	70	88	18.61	25.62
Care & Management	36	67	9.57	19.48
Breeding	36	13	9.58	3.77
Miscellaneous	12		3.19	
TOTAL	376	343	100 /	100 /

/ Approximately-- calculations carried out two decimals only.

Table 2.--This table is similar to number 1 except that it is worked out on the topical basis. The first column represents the topics discussed in each book in the order of their treatment. There seems to be a remarkable variation in this table. Harper allows more space to Breeds, Feeding and Care and Management; Plumb allows more to Judging and to Breeding and has an introductory chapter which Harper lacks. It has been impossible to evaluate these differences other than by judgment. Plumb gives nearly one-third of his text to the subject of judging, Harper a little over one-sixth. In the judgment of the writer, Harper's proportion is the more nearly correct. There is not enough difference in "breeds" to necessitate comment. In "Feeding" Plumb saves space in treating the topic in a general way, but this method is subject to criticism. The same applies to "Care and Management", lack of definiteness

here is more faulty. A large part of the interest in Animal Husbandry lies in this topic and it should be treated in a concrete way. In "Breeding" a compromise between the two allotments would be more satisfactory. Harper is to be criticised for not providing an introductory chapter.

TABLE NUMBER 3

A Comparison between Space by Pages allotted to various classes of Stock and the Value of these classes of Stock in Minnesota.

Classes of Stock	Percent of Space		Percentage value of each class of stock in relation to total value of Minnesota livestock. /
	Plumb	Harper	
Horses	24.55	25.75	24
Cattle	22.87"	27.82"	41
Sheep	19.41'	19.04'	2
Swine	16.49	14.96	20
Poultry	16.57#	12.53	13

" Not enough space in proportion to needs and value of the cattle industry--closer approach in Harper

' Somewhat too large in proportion to other classes of stock but should be larger than sheep "value" because of need for growth of sheep industry in Minnesota.

Too large--accounted for by the thought that children studying Animal Husbandry may be able to work more with poultry than with other classes of stock.

/ Data taken from the latest report of the Federal Statistician for Minnesota.

Table 3.--This table is an attempt to evaluate the texts on one basis. The proportionate amount of space in the texts allowed each class of stock compared with the value of that class of stock in the State of Minnesota. This method of evaluation is faulty in several respects--altho the figures on the livestock value are the most accurate to be obtained, they represent merely the value of the animals themselves, not their potential value as represented in production.--Even tho "production values" might be obtained, it is certain that this Table should not be the sole criteria of amount of space to be allotted each class of stock. It is probably true, however, that this "value" should be one of the factors in evaluation. The foot notes give sufficient explanation of variation.

GRAPH OF TABLE NUMBER 3

V-VALUE
H-HARPER
P-PLUMB

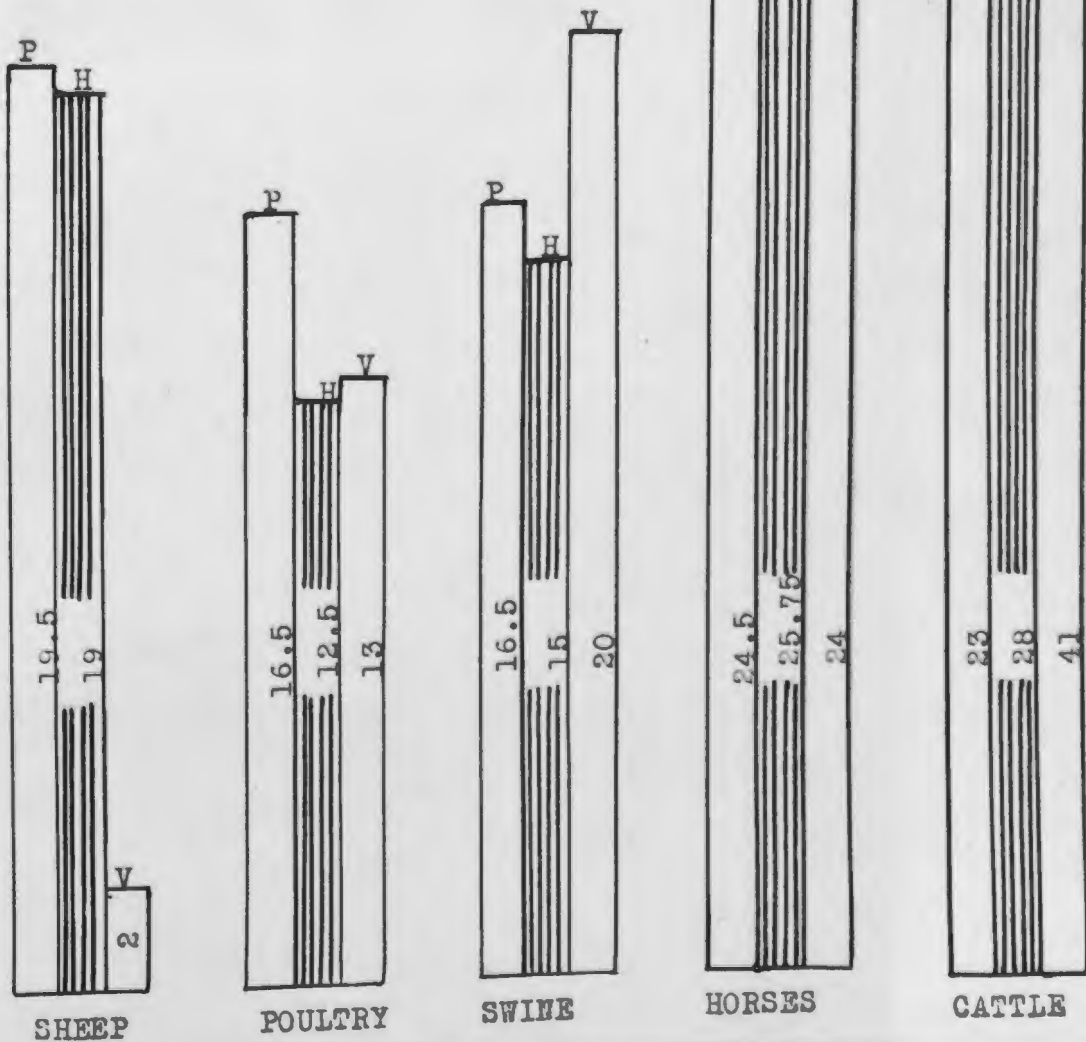


TABLE NUMBER 4

Comparison of Illustrations in Plumb's and Harper's Texts
On Animal Husbandry, showing number and Percentage of Total.

Illustrations	Number		Percentage	
	Plumb	Harper	Plumb	Harper
Total	216	153	100.0	100.0
Photographs	191	136	88.43	88.89
Drawings	25	17	11.57	11.11
Full page	4	12	1.8	7.8
One-half page	27	43	12.5	28.1
1/6 to 1/3 page	185	98	85.6	64.0
Faulty /	8	2	3.7	1.3

/ Refers to illustrations inferior because of mechanical faults or because of lack of educative value.

Table Number 4.--This table is a comparison of the number, size and character of the illustrations in Plumb's and Harper's texts. It will be seen that Plumb has a larger total number - Percentage of photographs as compared with drawings is the same--Harper, however, has a much larger proportion of full and half-page illustrations than has Plumb. The latter has too many small pictures. The figures in both books are numbered and the descriptive lines are satisfactory in both. As may be seen from the table, Plumb has the larger proportion of faulty illustrations.

TABLE NUMBER 5:

Comparison by Pages of Devices/ and Tables in Plumb's and Harper's
Texts on Animal Husbandry Designed to Aid Teaching

Devices & Tables	Number of Pages	
	Plumb	Harper
Appendices#	2	50
Laboratory Exercises	0	33
Energy Value of Feeding Stuff	0	2
Agricultural Book List	0	1
List Experiment Stations	0	2
Weights Feeding Stuffs	0	1
Table Digestible Nutrients	1	11
Feeding Standards	1	0
Index #	5	11
Table of Contents #	1	112
Illustration list #	0	4
Lists of Questions	27*	23*

* Refers to number of lists

/ Other than illustrations

Not included in Table Number 1

Table 5.--This table is a comparison of devices and tables which may be of value to teachers or pupils. Most of this material is found in the appendix. Harper has a distinct advantage here. The tables and exercises are valuable in connection with the subject matter. The Index, Table of Contents, and list of Illustrations are complete in Harper and only rudimentary or entirely lacking in Plumb. With reference to the Lists of Questions, however, Plumb is distinctly superior, the Questions having an "extension" value.

TABLE NUMBER 6.

Comparative Scores of Plumb's and Harper's Texts on Animal Husbandry
Based on Score Card Developed by Division of Agricultural
Education, University of Minnesota.

Points Scored	Perfect Score	Writer's Score	
		Plumb	Harper
Content	(40)		
Adaptability	10	9	10
Proportion	10	7	9
Accuracy	5	5	5
References	5	3	1
Laboratory Exercises	5	5	5
Index	5	4.5	5
Pedagogical Character	(40)		
Sequence	10	6	9
Correlations	10	9	9
Clearness	10	6	9
Vocabulary	5	4.5	5
Illustrations	5	4	4.5
Mechanical Construction	(20)		
Binding	2	2	1.5
Paper	2	2	1.5
Type	5	5	5
Cuts	5	4	5
Heading & Paragraphs	5	4.5	5
Size	1	1	1
TOTAL	100	77.0	89.5

Table 6.--This table is another attempt at evaluation. The score card used has been developed during the past six years by the faculty and students of the Division of Agricultural Education, University of Minnesota. These men have all been trained in score card use in agricultural subjects, and consequently are versed in the general principles of the score card method. All are students of agriculture, and most, the faculty in particular, are professionally and practically trained teachers. Each senior class in Agricultural Education has been invited to revise the score card.

The writer had hoped to secure a record of the scores of the two books which had been worked out by these senior students. He expected in this way to reach some more definite conclusion as to the value of the books for use in Minnesota. These records have disappeared, however, and the only score available is that of the writer. This of course is merely opinion, but is based upon a careful study of both Harper and Plumb and upon a conversance with Minnesota's agricultural conditions.

CONCLUSIONS

Quantitatively there is very little difference between Plumb's and Harper's texts in Animal Husbandry. There is practically no difference when proportion is figured on the basis of "Classes of Stock" but there is a much wider difference when proportion is taken in the "Topical" (Breeding, Feeding, etc.) basis. The better proportion is found in Harper. Harper also has an advantage in more nearly approaching the "Value Criteria" as shown in Table 3.

From the pedagogic standpoint the arrangement of the

subject matter followed in Harper is more satisfactory. Horses, Cattle, Sheep and Swine and Poultry are treated as units and each is completed before passing to a new topic. The only topic which has a large number of general qualities basic to particularization is Feeding. This Harper handles in a chapter by itself.

Harper is far superior in devices and tables designed to aid in teaching. Plumb suggests no laboratory work except in a most indirect way, the tables supplementing "Feeding" are very meagre or lacking entirely, the table of contents is merely a list of chapter titles, the index is too brief, illustrations are mostly small and often lacking in pedagogic value.

In the matter of clearness, both texts are to be faulted somewhat. Plumb, however, is bad in this respect, many sentences and phrases being ambiguous.

Plumb's text, in the writer's opinion, is superior only in question lists, binding and paper. By a special reinforced construction the book is better able to withstand rough usage. The color of the paper is such that the type stands out more clearly than that of Harper.

From the above survey, it would seem that "Animal Husbandry for Schools" by M.W.Harper would be more satisfactory for the teaching of Animal Husbandry in Minnesota high schools than "Beginnings In Animal Husbandry" by C.S.Plumb.#

This book is being entirely revised at the present time and will soon be available for use. No copy could be secured for analysis at this time.

List of Minnesota schools having
Agricultural Departments for 1919-20,
including four upon which reports are based,
but which have now discontinued Agriculture.
Corrected to January 1, 1920.

SMITH-HUGHES		
Town	County	Agricultural Instructor
Albert Lea	Freeborn	L.W.Thurwachter Paul W.Chase
Alexandria	Douglas	K.A.Norsen
Austin'	Mower	W.O.Lutz
Blue Earth	Faribault	Benjamin Brickman
Brewster'	Nobles	R.E.Hubbard
Canby	Yellow Medicine	J.C.Hening
Cannon Falls	Goodhue	Charles Partridge
Chatfield	Fillmore	H.M.Hamlin
Clarissa	Todd	Axel B.Johnson
Cokato	Wright	J.W.Kauffman
Deer River	Itasca	E.G.Shaad
Fairmont	Martin	Paul Calrow
Fosston	Polk	John R.Hewitt
Grand Rapids	Itasca	A.H.Frick
Hector	Renville	George Girrbaach
Henderson	Sibley	E.A.Coe
Jackson	Jackson	P.M.Hewitt
Kasson	Dodge	G.S.Ellis
Lamberton	Redwood	W.C.Hicks
Lewiston	Winona	H.B.Swanson
Madelia	Watonwan	E.N.Johnson
Mantorville	Dodge	S.A.Aldrich

' Answers based on Non Smith-Hughes work.

Town	County	Agricultural Instructor
Montevideo	Chippewa	J.F.Lefforge
New Richland	Waseca	F.L.Crowe
Norwood-Young America	Carver	M.Knoblauch
Olivia	Renville	Carl E.Nelson
Owatonna	Steele	Henry W.Hartle
Park Rapids	Hubbard	H.A.Pflughoeft
Pine River	Cass	Hugo G.Klumb
Pipestone	Pipestone	V.A.Edwards
Redwood Falls	Redwood	M.R.H.Treu
Renville	Renville	W.Reiley
St.Peter	Nicollet	Earl Springer
Sandstone	Pine	Harold H.Amos
Sauk Centre	Stearns	E.M.Gillig
Sleepy Eye	Brown	D.J.Heppner
Spring Grove	Houston	Louis E.Schreiber
Thief River Falls	Pennington	F.A.Tripp
Tracy	Lyon	Louis Kelehan
Waseca	Waseca	D.F.Adams
Wheaton	Traverse	Wilbur Drake

NON SMITH-HUGHES

Town	County	Agricultural Instructor
Aitkin	Aitkin	Leo W. Dahms
Appleton	Swift	Leslie Colby
Aurora	St. Louis	Harold Aase
Bagley	Clearwater	J. J. Sazama
Barnum	Carleton	John Meissner
Bemidji	Beltrami	Harry J. Olin
Benson	Swift	Carlyle Campbell
Big Falls	Koochiching	Fred S. Idtse
Blackduck	Beltrami	Stephen T. Dexter
Chisholm	St. Louis	G. W. Palmer
Clinton	Bigstone	R. B. Fall
Dassel	Meeker	D. C. Dvoracek
Detroit	Becker	Paul Derby
Duluth	St. Louis	Clark D. Mason
East Grand Forks	Polk	Oscar Knudson
Elbow Lake	Grant	Emil A. Oman
Eveleth	St. Louis	C. J. Skrivseth
Excelsior	Hennepin	R. E. McKenney
Faribault	Rice	R. A. Brown
Fisher	Polk	Theodore Thorson
Gilbert	St. Louis	C. S. Faunce
Glyndon	Clay	F. L. Behling
Granite Falls	Yellow Medicine	Thomas Spring
Harmony*	Fillmore	K. E. Poehler
Hastings	Dakota	J. K. Nord

* 1917-1918 Department since discontinued.

Town	County	Agricultural Instructor
Hawley	Clay	N.R.Redman
Hayfield	Dodge	Herbert T.Betsinger
Hill City	Aitkin	C.L.Yule
Hinckley	Pine	G.H.Ilse
Howard Lake	Wright	W.F.Gardiner
Hutchinson	McLeod	F.H.Turner
International Falls	Koochiching	C.A.Anderson
Lake City	Wabasha	H.C.Timberlake
Lanesboro	Fillmore	Benjamin Hofstad
Le Sueur	Le Sueur	E.R.Clark
Le Sueur Center	Le Sueur	A.M.Jacobson
Lindstrom	Chisago	Jackson Demary
Litchfield	Meeker	F.J.E.Persun
Little Falls	Morrison	H.M.Swift
Long Prairie	Todd	P.S.Dyer
McIntosh	Polk	Palmer Johnson
Mankato"	Blue Earth	G.A.Strobel
Medford"	Steele	Wilbur Drake
Melrose	Stearns	Reno Smith
Milaca	Mille Lacs	Leroy Uptegrafft
Minneapolis	Hennepin	A.V.Storm, Jr.
Montgomery"	Le Sueur	D.C.Dvoracek
Morgan	Redwood	H.M.Price
Nashwauk	Itasca	A.J.Souba
Northfield	Rice	Blanche Corwin
Pequot	Crow Wing	R.S.Doherty

" 1917-1918 Department since discontinued.

Town	County	Agricultural Instructor
Pine City	Pine	Ira Montgomery
Preston	Fillmore	Floyd Adams
Red Wing	Goodhue	H.G.Diepenbrock
Round Lake	Nobles	M.F.Carr
St. Cloud	Stearns	A.E.White side
Shakopee	Scott	R.V.Larson
South St.Paul	Ramsey	Frank Tibbetts
Springfield	Brown	Ernest Baird
Spring Valley	Fillmore	K.K.Poehler
Staples	Todd	Dan C.Glennon
Stephen	Marshall	G.A.Strobel
Two Harbors	Lake	E.D.Ayres
Virginia'	St.Louis	Otto A.Stangel
Wadena	Wadena	A.O.Becker
Walker	Cass	V.L.Konigsmark
Warren	Marshall	Herman J.Hookom
Warroad	Rosseau	H.J.Hembre
Westbrook	Cottonwood	J.B.Wright

' Answers based on Smith-Hughes work.

B I B L I O G R A P H Y

Books

Aims of Education	Strayer
Briefer Course in Teaching Process	Strayer
Democracy's High School	Lewis
Democracy and Education	Dewey
Education for Efficiency	Davenport
Educative Process	Bagley
Methods of Teaching in High Schools	Parker
Principles of Education	Ingliss
Principles of Education	Klapper
Psychology	Judd
Problems of Secondary Education	Snedden
Problems of Vocational Education	Snedden
Teaching of Agriculture	Nolan
Vocational Agricultural Education	Stimson

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