UNIVERSITY OF ILLINOIS
Agricultural Experiment Station

BULLETIN No. 262

FEEDING PUREBRED DRAFT FILLIES

By J. L. Edmonds and C. W. Crawford

URBANA, ILLINOIS, APRIL, 1925

SUMMARY

Sheaf oats and alfalfa hay supplemented with half a ration of oats and bran proved to be satisfactory feeds for weanling draft fillies during their first winter. The roughage was fed in the proportion of one part sheaf oats to two parts alfalfa. Three pounds of oats were fed to one pound of bran. During their first winter the fillies ate an average of 4.77 pounds of oats and bran, 10.47 pounds of alfalfa hay, and 4.93 pounds of sheaf oats per day.

Sweet clover during the first part of the grazing season and bluegrass during the latter part made a good pasture combination for yearling draft fillies. They made a good growth on this pasture and also remained clean in their legs. While grazing on sweet clover, however, the fillies seemed to crave some other feed. They ate a considerable quantity of their wheat-straw bedding during this period, which seemed to indicate that better results would be obtained by giving some additional feed to young fillies on sweet-clover pasture. During the latter part of the summer they were fed some oats and bran and later a light feed of sheaf oats. Their average daily consumption for the summer was 4.23 pounds of oats and bran and 1.27 pounds of sheaf oats.

During most of the second winter sheaf oats and alfalfa hay were fed in approximately equal amounts without any threshed grain. These feeds produced a good growth in height and frame. These fillies, however, were not so heavy as some other lots fed at this Station which received more grain and consequently were in higher condition. During the second winter the average consumption of alfalfa was 12.61 pounds per day and of sheaf oats 13.8 pounds per day.

The illustration on page 259 shows the fillies as yearlings. The cover picture and the individual pictures on pages 250 to 254 show them as two-year-olds, at the end of the experiment, and give a good idea of the kind of development made; their average weight at this time was 1,446 pounds and their average height 15 hands, 3.8 inches.

FEEDING PUREBRED DRAFT FILLIES

By J. L. Edmonds, Chief in Horse Husbandry, and C. W. Crawford,
Associate in Animal Husbandry

The experiment reported herein is a continuation of three previous experiments in feeding purebred draft fillies already reported in Bulletins 192 and 235 of this Station. In this series of experiments an effort has been made to use chiefly home-grown feeds, the production of which would fit in well with the best methods of farming in Illinois. A legume hay has been the foundation of the winter rations and pasture the main summer feed.

In the first experiment, reported in Bulletin 192, the fillies developed satisfactorily on a ration of alfalfa hay, corn, and oats. In the second and third experiments, reported in Bulletin 235, an effort was made to find a better ration than this if possible, even tho it would necessitate the purchase of a little mill feed. An effort was also made to cheapen the rations by using a carbonaceous roughage to supplement the legume hay. Oat straw and oat hay were used with success for this purpose. The following concentrates were used: corn and oats; corn, oats, and bran; crushed oats and bran; ground corn and bran. Of these rations, the one composed of crushed oats 75 percent and bran 25 percent was most satisfactory, except for its cost. Where corn was fed, the fillies developed plenty of size and weight, but did not have as clean legs as the fillies fed a smaller amount of corn or none at all.

In the last test (the fourth, described herein) an effort was made to use a pasture in combination with blue-grass which would give better results during the hot, dry months than blue-grass alone. Sweet clover was used satisfactorily for this purpose.

It is a well-known fact that liberal feeding must be combined with draft blood to produce horses of the size desired today. But this feeding should also be done economically. In the fourth experiment the feeding of sheaf oats lessened the amount of alfalfa and grain required and thus cut down the feed bill considerably. At the same time it made a better balanced ration than one with alfalfa as the only roughage.

Fifty-two fillies were used in the four experiments.

PLAN OF FOURTH EXPERIMENT

One lot of ten Percheron weanling fillies was used in this trial. Five of these fillies were bred at the University and five were purchased from other breeders. The experiment was begun December 11, 1922, and was continued until April 28, 1924, a total of 504 days.

FEEDS USED

The concentrates used were crushed oats 75 percent and bran 25 percent, which produced the best results of several rations fed in preceding experiments, but was more expensive than some others used. Grain was fed during the first winter and during the middle part of the pasture season. Practically no threshed grain was fed the second winter. Approximately one-half of the roughage fed, however, consisted of sheaf oats in which the grain was fully matured. Alfalfa hay formed the other half of the roughage. Care was taken to limit the amount of alfalfa fed, so that the straw in the sheaf oats would be eaten up clean as well as the alfalfa.

Sheaf oats proved to be a very satisfactory feed in this experiment.[1] They are easier to cure than hay and require no threshing expense. They are also convenient to feed. They are not, however, so easily stored as hay, and much of the grain will be eaten or soiled by mice and rats unless some precaution is taken. The sheaf oats used in this experiment were stacked in a shed. In order to keep out rats and mice, air-slacked lime was scattered over the bundles as the stacking proceeded. This treatment was satisfactory, since the lime seemed to make no difference in the palatability of the feed so far as the fillies were concerned. In the handling and weighing necessary before feeding, a good deal of the lime was shaken off.[2] The sheaf oats and alfalfa used were grown on the University farm and were of good quality.

Both the grain and the roughage were fed twice daily in mangers built along the sides of roomy box stalls. The lot was fed as a group, and the feeding done in such a way that all feeds were thoroly cleaned up. Consequently there were no refused feeds to be weighed and recorded.

Salt was fed with the grain. When no grain was fed, salt was kept before the fillies at all times. Water was always available in the barn as well as in the pastures.

The pastures used were sweet clover during the first part of the season and blue-grass during the latter part. The ten fillies were turned on eight acres of second-year sweet clover on April 30. The clover, however, grew too rapidly for them, and on May 26 they were confined to half of the field. They had eaten four acres down rather closely by June 26, at which time an adjoining field of 3.6 acres of first-year sweet clover was opened to them in addition to the four acres they were on. Five brood mares and their foals had been on this 3.6-acre field from June 10 to June 26.

When first turned on sweet clover, these fillies ate considerable of their wheat-straw bedding, which would seem to indicate that there was

[1] Sweet clover was sown in the oats and had made considerable growth by the time of cutting. Very little sweet clover appeared in the bundles, however.

[2] In putting up this year's sheaf oats, 250 pounds of hydrated lime was used on 34 tons of sheaf oats.

something lacking in the sweet clover which the fillies desired. They ate less straw as the experiment progressed. By August 13 the sweet clover was well eaten off and the fillies were turned on a good blue-grass pasture of eight acres, where they ran until December 17.[1] By the first of November the grass was eaten off rather closely, but the fillies were allowed to run in the pasture for exercise.

SHELTER AND CARE

The shelter for the fillies consisted of four box stalls with open doorways between them. These boxes were 16 feet wide and their combined length was 72 feet. The entrances to the box stalls were equipped with two doors, an inner slat door, and an outer solid door. During the winter, if the weather was mild, only the slat doors were closed at night; if it was stormy or very cold, the outer solid doors were partly or entirely closed as a protection against drafts, but provision was always made for the free circulation of air thru the stalls. These doors, which were 8 feet wide, opened into cindered exercise lots which connected the barn with the pasture. The fillies were in these lots every day during the winter and ran on pasture from spring until early winter.

This method of stabling insured sufficient protection without unduly depriving the fillies of opportunity for exercise; and exercise must accompany good feeding if the best all-round results are to be obtained.

During the summer canvas "flappers" nailed to the over-head joists assisted in keeping the flies off the backs of the fillies. A coal-tar disinfectant applied to the lower part of the canvas prevented it from being chewed or torn down. As further protection from flies, the stalls were darkened with burlap curtains hung over the windows and doorways.

Wheat straw was used as bedding. The manure was removed from the stalls each day.

During the winter the fillies were occasionally given a hurried grooming with a "dandy brush." As often as necessary—about once a month—their feet were trimmed with a one-inch chisel and mallet.

FEED CONSUMED

The average daily ration of concentrates the first winter was a little less than 5 pounds per head. About the same weight of sheaf oats was fed and about 10.5 pounds of alfalfa, making the proportion of alfalfa to sheaf oats approximately 2 to 1. The average daily ration per hundredweight of animal of about one-half pound of grain, one pound of alfalfa, and one-half pound of sheaf oats, was found to be very satisfactory.

[1]The sweet-clover pastures furnished 127 days of grazing per acre for one horse and the blue-grass pasture 99 days.

ILLINI ELLA
175918
Grey

ILLINI ADA
176090
Grey

ILLINI JULIET
176091
Grey

ILLINI IDA
175919
Grey

ILLINI JUNO
175920
Grey

RUTH
175882
Black

The ration of alfalfa hay and sheaf oats fed the second winter was also considered a good one. At that time these roughages were fed in about equal amounts, a little more sheaf oats being fed than alfalfa. During a considerable part of the winter these fillies ate 14 pounds of alfalfa and 15 pounds of sheaf oats per head daily, making a total of 29 pounds.[1]

While the fillies did not make large gains in weight on this ration, they grew considerably in height and were in thrifty condition. They were also free from puffiness in the hocks and were in nice shape to make good gains on pasture. This experiment supported the conclusion drawn from preceding observations, that the addition of a carbonaceous roughage is desirable when feeding alfalfa hay to draft fillies.

TABLE 1.—FEED CONSUMED: NOT INCLUDING PASTURE

Period: 28 days	Average daily ration per head			Average daily feed per cwt. of animal		
	Cr. oats 75% Bran 25%	Alfalfa	Sheaf oats	Cr. oats 75% Bran 25%	Alfalfa	Sheaf oats
	lbs.	*lbs.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
Dec. 11, 1922–Jan. 8, 1923	4.39	9.50	3.48	.493	1.067	.391
Jan. 8–Feb. 5	4.55	9.46	4.46	.495	1.029	.485
Feb. 5–Mar. 5	4.74	10.14	5.07	.493	1.055	.527
Mar. 5–Apr. 2	4.97	11.23	5.63	.496	1.121	.562
Apr. 2–Apr. 30	5.17	12.00	6.00	.492	1.141	.570
Apr. 30–May 28	.28	.61	....	.026	.057	....
May 28–June 25	1.15	....	....	.104	....	....
June 25–July 23	5.60	....	....	.493	....	....
July 23–Aug. 20	5.74	....	....	.489	....	....
Aug. 20–Sept. 17	6.23	....	3.00	.497	....	.240
Sept. 17–Oct. 15	6.40	....	4.60	.499	....	.358
Oct. 15–Nov. 12	4.00	6.50	8.60	.304	.494	.654
Nov. 12–Dec. 10	....	13.00	13.00	....	.963	.963
Dec. 10, 1923–Jan. 7, 1924	....	13.00	15.00	....	.957	1.104
Jan. 7–Feb. 4	....	13.75	15.00	....	1.007	1.098
Feb. 4–Mar. 3	....	14.00	15.00	....	1.015	1.088
Mar. 3–Mar. 31	....	14.00	15.00	....	1.000	1.071
Mar. 31–Apr. 28	....	14.00	15.00	....	.983	1.053
Dec. 11, 1922–Apr. 28, 1924, 504 days	2.96	7.84	7.16	.249	.659	.602

The appearance of the fillies when running on sweet clover indicated that sweet-clover pasture without grain is not entirely satisfactory for yearling fillies. They seemed to grow well on it, developing considerably in frame and bone, but they were thinner than most horsemen

[1]These oats were an early variety which has averaged about half grain and half straw under local conditions.

BONNIE DECIME
175585
Black

LENORA
175698
Grey

HILDEFONSE
175672
Black

would desire. They were, however, very clean and sound in their legs. Several horsemen who saw them made especial mention of this fact.

During this period when the fillies were on sweet clover, they ate a considerable amount of their wheat-straw bedding. If this had been oat straw, it is probable that better gains would have been secured.

The detailed data concerning the feeds consumed by the fillies, aside from pasture, is given in Table 1. Following is a brief summary in terms of bushels, pounds, and tons.

	First winter (140 days)	*Summer (168 days)*	*Second winter (196 days)*	*Total (504 days)*
Oats	15.63 bu.	16.67 bu.	2.63 bu.	34.93 bu.
Bran	166.78 lbs.	177.81 lbs.	28.00 lbs.	372.59 lbs.
Alfalfa	.73 ton	.009 ton	1.24 tons	1.98 tons
Sheaf oats	.35 ton	.10 ton	1.35 tons	1.80 tons

VALUE OF PASTURE

As is always the case, the pasture proved to be a very important factor in the development of the fillies. In order to maintain satisfactory gains, it was found necessary to feed some grain with sweet-clover pasture. To feed grain in this way is more economical and safer than to let colts get thin on pasture and then attempt to put them in condition

GENILFONSE, 174198, Grey

when they are taken up in the fall. These fillies made a good growth in frame on pasture and were especially clean in their legs and hard in their joints.

The combination of sweet clover and blue-grass was regarded very highly. Blue-grass does not grow well in this locality during the hot, dry months and sweet clover dies when eaten off closely by horses. The second-year sweet clover was given a chance to get a good start and

then pastured heavily. By the time it was eaten off, a blue-grass pasture which had been saved had a very heavy growth. The fillies gained very rapidly when turned on this pasture. There was an abundance of grass for them and its nutritive value was much higher than it would have been in the early spring, when grass is likely to be washy.

DEVELOPMENT OF FILLIES

The fillies were weighed at the beginning and end of the experiment, at one and two years of age, and at the finish of the summer and winter feeding periods. Their heights were measured at the same time.

The purpose in feeding was not to make maximum gains in weight but to secure a good growth without any puffiness in the joints. All the

TABLE 2.—AGES, HEIGHTS, AND WEIGHTS OF FILLIES AT THE BEGINNING AND END OF THE EXPERIMENT

Name	Age Dec. 11, 1922	Height		Weight Dec. 11, 1922	Gain		Final weight Apr. 28, 1924
		Dec. 11, 1922	Apr. 28, 1924		Dec. 10, 1923	Apr. 28, 1924	
	days	*hands in.*	*hands in.*	*lbs.*	*lbs.*	*lbs.*	*lbs.*
1. Illini Ella...	227	14 1¾	16 1	930	525	595	1525
2. Illini Ada...	246	14 1½	15 3½	975	460	505	1480
3. Illini Juliet..	222	13 2½	15 1¾	840	420	480	1320
4. Illini Ida....	183	13 3¼	15 3¼	790	470	545	1335
5. Illini Juno..	170	13 3¾	16 ½	760	500	565	1325
6. Ruth.....	184	13 3¾	15 3¼	815	520	590	1405
7. Bonnie Decime....	204	13 2½	15 2	755	540	670	1425
8. Lenora.....	246	14 1¼	16	965	510	595	1560
9. Hildefonse..	271	14 3½	16 1½	1020	440	545	1565
10. Genilfonse..	231	14 ¼	15 3¾	890	470	560	1450
Average.....	218.4	14 .4	15 3.65	874	485.5	565	1439

TABLE 3.—WEIGHTS AND HEIGHTS OF THE FILLIES AT ONE AND TWO YEARS OF AGE

Name	Weight at 1 year	Weight at 2 years	Gain in weight during 2d year	Height at 1 year	Height at 2 years	Gain in height during 2d year
	lbs.	*lbs.*	*lbs.*	*hands in.*	*hands in.*	*hands in.*
1. Illini Ella.....	1165	1525	360	15 1¾	16 1	3¼
2. Illini Ada.....	1125	1435	310	15 ¼	15 3¼	3
3. Illini Juliet.....	995	1320	325	14 2¾	15 1	2¼
4. Illini Ida.....	965	1380	415	14 3	16 ½	1 1½
5. Illini Juno.....	1035	1425	390	15 ¼	16 1½	1 1¼
6. Ruth.....	1010	1430	420	15 ½	16	3½
7. Bonnie Decime.....	1010	1430	420	14 3	15 2½	3½
8. Lenora.....	1110	1540	430	15 ½	15 3½	3
9. Hildefonse.....	1165	1520	355	15 1¼	16 1	3¾
10. Genilfonse.....	1120	1455	335	14 3½	15 3¾	1 ¼
Average.....	1070	1446	376	15 .075	15 3.8	.931

fillies were sound at the close of the experiment, and at no time during the experiment were they fat. Most Percheron breeders would have thought them thin. They were, however, in thrifty growing condition except during the period when they were on pasture with no grain. The reason for not feeding grain at this time was to determine whether or not it was necessary with sweet-clover pasture.

The accompanying photographs of the fillies, which were taken at the close of the experiment, after they had shed off on grass, give a good idea of the kind of development made.[1]

TABLE 4.—FEED CONSUMED AND GAINS BY SEASONS: NOT INCLUDING PASTURE

	Feed consumed			Gains	
	Cr. oats 75% Bran 25%	Alfalfa	Sheaf oats		
First Winter: Dec. 11, 1922–Apr. 30, 1923—140 days					
	lbs.	*lbs.*	*lbs.*		
Feed per head...	667.10	1465.50	690.00	Aver. gain in weight, *lbs.*.....	200.00
Aver. daily ration	4.77	10.47	4.93	Aver. daily gain in weight, *lbs.*.	1.43
Aver. daily ration per cwt.....	.49	1.08	.51	Aver. gain in height, *inches*....	3.23
Aver. feed per pound gain....	3.34	7.33	3.45		
Summer: Apr. 30, 1923–Oct. 15, 1923—168 days					
Feed per head...	711.25	17.00	212.80	Aver. gain in weight, *lbs.*.....	221.50
Aver. daily ration	4.23	.10	1.27	Aver. daily gain in weight, *lbs*..	1.32
Aver. daily ration per cwt.....	.36	.01	.11	Aver. gain in height, *inches*....	2.80
Aver. feed per pound gain....	3.21	.08	.96		
Second Winter: Oct. 15, 1923–Apr. 28, 1924—196 days					
Feed per head...	112.00	2471.0	2704.8	Aver. gain in weight, *lbs.*.....	143.5
Aver. daily ration	.57	12.61	13.80	Aver. daily gain in weight, *lbs*...	.73
Aver. daily ration per cwt.....	.04	.92	1.01	Aver. gain in height, *inches*....	1.23
Aver. feed per pound gain....	.78	17.22	18.85		
1 Year 4½ Months: Dec. 11, 1922–Apr. 28, 1924—504 days					
Feed per head...	1490.35	3953.5	3607.6	Aver. gain in weight, *lbs.*.....	565.00
Aver. daily ration	2.96	7.84	7.16	Aver. daily gain in weight, *lbs*..	1.12
Aver. daily ration per cwt.....	.249	.659	.602	Aver. gain in height, *inches*....	7.25
Aver. feed per pound gain....	2.64	7.00	6.39		

[1]The first five fillies, Illini Ella, Illini Ada, Illini Juliet, Illini Ida, Illini Juno, were bred by the University of Illinois. Ruth was bred by Hunt Brothers, Henry, Ill.; Bonnie Decime, by Thomas Caygill and Sons, Linden, Wis.; Lenora, by William and Fred Finch, Verona, Ill., Hildefonse, by George Frerichs and Sons, Gilman, Ill.; and Genilfonse, by F. D. Fruin, Gilman, Ill.

COST OF FEEDS

Table 5 shows the cost of feeds at different prices. Of course, the extreme fluctuations in the prices of farm products make any cost table of more or less temporary value; but if one knows approximately the quantity of feed required to grow a horse a year, the cost may be calcu-

TABLE 5.—COST OF FEEDS PER HEAD
(For feed prices, see bottom of page)

Scale of prices	A	B	C	D	E
First Winter: Dec. 11, 1922–Apr. 30, 1923—140 days					
Grain	$ 8.42	$ 8.42	$ 7.64	$13.34	$12.72
Alfalfa and Sheaf Oats	15.17	15.09	11.51	25.22	24.53
Total	23.59	23.51	19.15	38.56	37.25
Cost per day	.169	.168	.137	.275	.266
Cost per pound gain	.118	.118	.096	.193	.186
Summer: Apr. 30, 1923–Oct. 15, 1923—168 days					
Grain	$ 8.98	$ 8.98	$ 8.14	$14.23	$13.56
Alfalfa and sheaf oats	1.20	1.61	1.15	2.34	2.13
Pasture	15.50	15.50	15.50	18.60	18.60
Total	25.68	26.09	24.79	35.17	34.29
Cost per day	.153	.155	.148	.209	.204
Cost per pound gain	.116	.118	.112	.159	.155
Second Winter: Oct. 15, 1923–Apr. 28, 1924—196 days					
Grain	$ 1.41	$ 1.41	$ 1.28	$ 2.24	$ 2.14
Alfalfa and sheaf oats	33.29	36.23	27.11	57.94	55.23
Total	34.70	37.64	28.39	60.18	57.37
Cost per day	.177	.192	.145	.307	.293
Cost per pound gain	.242	.262	.198	.419	.400
Entire Period: Dec. 11, 1922–Apr. 28, 1924—504 days					
Grain	$18.81	$18.81	$17.06	$29.81	$28.42
Alfalfa and sheaf oats	49.66	52.93	39.77	85.50	81.89
Pasture	15.50	15.50	15.50	18.60	18.60
Total	83.97	87.24	72.33	133.91	128.91
Cost per day	.167	.173	.144	.266	.256
Cost per pound gain	.149	.154	.128	.237	.228
Feed Prices					
	A	B	C	D	E
Oats per bushel	$ .40	$ .40	$ .35	$ .64	$ .60
Bran, per ton	26.00	26.00	26.00	40.00	40.00
Alfalfa, per ton	16.00	14.00	11.00	25.00	25.00
Sheaf oats, per ton	10.00	14.00	10.00	20.00	18.00
Pasture, per acre	10.00	10.00	10.00	12.00	12.00

lated readily on the basis of current prices. Economical feeding should be the aim always, but poor feeding to lessen the cost of production is false economy. The average cost per head per day on the basis of the "A" prices was 16.7 cents.

EXPLANATION OF FINANCIAL CHART

The following chart, which is similar to ones which have been used at this Station in reports of steer and lamb feeding experiments, offers a quick method of estimating feed costs. Such estimates are of course less accurate when applied to the development of breeding

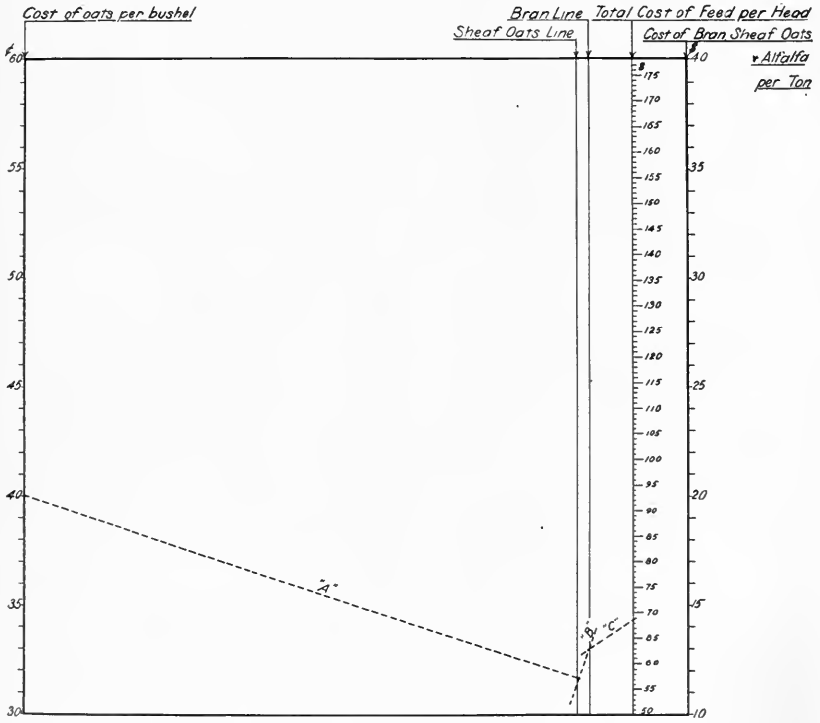

CHART FOR CALCULATING COST OF FEED PER HEAD

Directions for using this chart are given above. Because of limitations of space, the chart is small for practical use, but is inserted here by way of illustration. Readers who are interested in this method of calculating costs may obtain a wall chart for a small charge by addressing the Experiment Station.

animals than when used to figure the expense of fattening meat animals, because the former are fed over a longer period of time and consequently feed prices change more. Furthermore, with breeding animals the emphasis should be put on healthy development rather than high condition.

For the purpose of illustration, assume the price of the feeds to be as follows: oats, 40 cents a bushel; sheaf oats, $10 a ton; bran, $26 a ton; and alfalfa, $16 a ton. To read the chart, place a straight edge or string across its face so that the straight edge or string connects the points on the outside scales representing the price of oats and sheaf oats respectively. (See line "A" on the chart.) Mark the place where the straight edge crosses the line in the chart marked "sheaf oats," and connect this point with the figure on the right-hand scale representing the cost of bran. (See line "B" on the chart.) Mark the place where the straight edge crosses the line marked "bran line" and connect this point with the figure on the right-hand scale representing the cost of alfalfa. (See line "C" on the chart.) The point where the straight edge now crosses the line marked "total cost of feed per head" is approximately $68.50. This figure represents the total cost of feed per head for the entire period. This same method may be used for any prices of these feeds. The essential thing is always to connect the points representing the prices of the feeds in the same order, viz., oats, sheaf oats, bran, and alfalfa.

DATA ON THE FOUR EXPERIMENTS

In the table on the following page will be found a summary of the data of all four experiments. A brief statement of the results was made in the introductory paragraphs on page 247; the figures are included here in order that the reader may make any comparison he may wish of the more important features of the experiments.

THE FILLIES AS YEARLINGS

This picture shows the way in which the sweet clover was eaten off closely in places while a good growth elsewhere was untouched. The whole field was finally grazed off closely.

TABLE 6.—SUMMARY OF FOUR EXPERIMENTS IN FEEDING PUREBRED DRAFT FILLIES

	First Experiment	Second Experiment		Third Experiment		Fourth Experiment
	Ear corn ½ Oats ½ Alfalfa hay Pasture (Reported in Bul. 192)	Lot I Corn 40% Oats 40% Bran 20% Alfalfa Oat straw Pasture	Lot II Corn 50% Oats 50% Alfalfa Oat straw Pasture	Lot I Cr. oats 75% Bran 25% Alfalfa Oat hay Pasture	Lot II Gr. corn 75% Bran 25% Alfalfa Oat hay Pasture	Cr. oats 75% Bran 25% Alfalfa Sheaf oats Pasture
		(Reported in Bulletin 235)				
Length of trial, *days*	518	518	518	490	490	504
Number of animals	10	8	8	8	8	10
Aver. age at beginning, *days*	214	230	220	251	260	218
Height:						
Aver. height at beginning	13 – 2.3″	13 – 3.5″	13 – 3.25″	14 – .53″	14 – .53″	14h .4″
Aver. height at close	15 – 2.3″	15 – 3.21″	15 – 3.19″	15 – 2.88″	15 – 3.38″	15 3.65
Aver. gain in height, *inches*	7.96	7.68	7.91	6.41	6.84	7.25
Weight:						
Aver. weight at beginning, *pounds*	823.00	811.25	818.13	846.25	853.13	874
Aver. weight at close	1513.50	1543.80	1544.40	1481.90	1490.00	1439
Aver. gain in weight	690.50	732.50	726.30	635.63	636.88	565
Aver. daily gain in weight	1.33	1.41	1.40	1.30	1.30	1.12
Grain:						
Total amount of grain eaten, *pounds*	5079.00	4403.72	4322.91	3114.94	2646.94	1490.35
Aver. amount of grain eaten per day	9.81	8.50	8.35	6.36	5.40	2.96
Aver. amount of grain eaten per day per cwt.	.811	.703	.695	.533	.445	.249
Hay:						
Total amount of hay eaten, *pounds*	5168.60	5762.25	5357.25	3185.00	3225.50	3953.5
Aver. amount of hay per day	9.98	11.12	10.34	6.50	6.58	7.84
Aver. amount of hay per day per cwt.	.825	.919	.861	.545	.543	.659
Other roughage:						
Total amount of other roughage eaten, *pounds*	.....	462.00	460.00	2491.25	2490.00	3607.6
Aver. amount of other roughage per day	.....	.89	.89	5.08	5.08	7.16
Aver. amount of other roughage per day per cwt.	.....	.074	.074	4.26	4.19	.602
Aver. amount of feed per pound gain:						
Grain	7.36	6.01	5.95	4.90	4.16	2.64
Alfalfa	7.49	7.87	7.38	5.01	5.06	7.00
Other roughage	.....	.631	.633	3.92	3.91	6.39