MISSOURI

Agricultural College Experiment Station.

BULLETIN No. 29.

Feeding Wheat to Pigs.

COLUMBIA, MISSOURI,

APRIL, 1895.

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INTRODUCTORY.

The experiment reported in this Bulletin was designed under the directorship of Dr. E. D. Porter and carried out in every detail by Mr. C. M. Conner. The illness and subsequent death of the director placed the responsibility of arranging and publishing the results upon the writer, who has drawn from them such conclusions as seemed to him both proper and logical. For these he alone must be held responsible, while to Mr. Conner belongs the credit of taking and recording the daily and periodical weights and making such notes during the progress of the trial as seemed desirable.

P. SCHWEITZER,

ACTING DIRECTOR.

FEEDING WHEAT TO PIGS.

P. SCHWEITZER.

The low price of wheat during the past few years has induced a number of experiment stations to conduct feeding trials with farm animals, whose chief object has been to determine whether feeding wheat was sufficiently remunerative to the farmer to induce him to continue raising it. To put the question in this form means, of course, that the raising of wheat at 50 cents a bushel and fifteen bushels per acre does *not* pay, and that it can only remain a staple crop in case we are able to increase its yield to twenty-five or thirty bushels without additional cost of production, or are unable to replace it in a true system of rotation by another crop that would maintain as well the equilibrium between the agricultural input and outgo of the land. The writer sees relief for the future of agriculture in both of these directions and confidently believes in its ultimate re-establishment as the safeguard and foundation stone of state and society.

The inquiry was sought to be answered by experiments with cattle, dairy stock and pigs, and, though the results demonstrated, *in a general way,* the value of wheat for feeding purposes, they did not settle the question as to whether wheat, when thus fed, is yet a profitable crop, nor whether selling it at present prices and investing the pro-

ceeds in other, different, feeds might not, after all, be still better. In fact, the question, like all questions in which politico-economical considerations are permitted to enter, does not admit of strictly scientific formulation and brings, therefore, no clear and definite answer.

The experiments at this station were made with pigs and are quite comprehensive; they embraced a feeding period of ninety days, with a preparatory period of nine days, in which the treatment of each lot was precisely as it was to be during the trial. Each lot, excepting No. 10 to No. 13, consisting of three animals of different ages and weights, which were selected in such manner as to make the lots themselves as near equal in these respects as it was possible to have them. All animals were high grade Berkshires and, at the beginning of the trial, healthy, and well developed. They continued in the main, to remain so, though an occasional falling off in feed and weight occurred to mar the even progress of the experiment, which, perhaps, is not to be regretted since it may in itself offer a lesson to profit by. Each lot was confined in a pen, ten by eighteen feet square, made of close fitting fence boards four feet in height, and having the northern end roofed over, but open to the south for sun and air; they had straw for a bedding, which was renewed frequently to insure cleanliness and comfort. An extra trough was put in each pen with a mixture of hardwood ashes, stone coal and salt. Of the feed, as much was given as the animals would eat up clean while, at the same time, a close watch was kept to prevent waste; of the mixed rations enough was prepared to last for ten days; this was put in bins and any surplus at the end of ten days weighed back and deducted. Where the feed was to be given wet, enough was weighed out to last for three days;

it was then put into tubs holding an equal weight of water and soaked for thirty-six hours, when it was drained and fed; any surplus left over was, as in the previous case, weighed back and deducted. No trouble was experienced in thus keeping account of the feed consumed; but to prevent any mistake at all separate daily records of the food of each lot were kept as a tally, so that all weights recorded here may be assumed to be strictly correct.

The pigs were weighed every tenth day in the same order and manner, and, when this was a Sunday, weighed twice, once on Saturday and then on Monday, and the mean of the two weighings recorded as the true weight for Sunday. All feed was purchased at the local mills at the following prices:

Wheat, $0.55 a bushel.

Wheat chop, $1.00 per 100 pounds.

Corn chop, $1.00 per 100 pounds.

Wheat bran, $0.75 per 100 pounds.

The wheat was good No. 2 wheat, such as was made into flour, and the corn, sound white corn, raised in the county. For the potatoes and artichokes, grown at the station, a valuation of 40 cents a bushel for the former and 30 cents for the latter was assumed to permit of a comparison of the cost of the different rations. All the valuations, especially those of wheat chop, corn chop and bran, are high, and, in fact, higher than should make the basis for the cost of product. Since they were, however, the actual prices which the station paid, they are permitted to stand. No uniform valuation prevails in the different sections of our state, and any farmer can readily fit our results to his own special conditions.

THE RATIONS.

The experiment was primarily undertaken to test the value of wheat as a food for growing and fattening pigs; it was made comprehensive enough to give a relative as well as absolute answer by extending it to pigs of different ages, and varying the rations as seemed practically desirable. The ages of the animals ranged from one month up to two and one-half, four and one-half, five, and six and one-half months at the time of trial, and the rations, thirteen in number, included a thirty days' test of potatoes and artichokes fed, the former boiled and the latter raw, in such amounts as the pigs would eat. Unfortunately the artichokes lasted but forty days, so that the experiment, counting the first ten days a period of preparation, had a length of only one month, which probably prevents drawing from it any general conclusions. The lot fed potatoes was carried through to the end on the same feed, while the other, on the artichokes giving out, was put for the remainder of the time on boiled wheat.

It only remains to say that the experiment began on November 7 and ended on February 14, 1895, that of lots X, XI, XII and XIII being continued a little longer, until sickness and finally death broke it up. All results are tabulated and put in a single table at the end of the bulletin for general comparison, while values bearing upon special points are grouped and discussed separately. The composition of the rations for the different lots was as follows, the parts being in every instance parts by weight:

Lot I.—Four parts of corn chop, one part of bran.

Lot II.—Two parts of corn chop, two parts of wheat chop, one part of bran.

Lot III.—Four parts of wheat chop, one part of bran.

Lot IV.—Wheat chop.

Lot V.—Wheat chop, wet (soaked for thirty-six hours.)

Lot VI.—Four parts of whole wheat, one part of bran, dry.

Lot VII.—Four parts of whole wheat, one part of bran, wet (soaked for thirty-six hours.)

Lot VIII.—Wheat chop and potatoes (boiled.)

Lot IX.—Wheat chop and artichokes (raw.)

Lot X.—Whole wheat, dry.

Lot XI.—Wheat chop, wet (soaked for thirty-six hours.)

Lot XII. Wheat chop and skim-milk (ad libit.)

Lot XIII. Corn meal and skim-milk (ad libit.)

THE RATE OF INCREASE.

The results can be easier apprehended by being tabulated under different headings. The rate of increase per 100 pounds of live weight, as given in the general table, has, therefore, been still further dissected, so as to bring all the animals, according to their respective ages, into five groups. By doing so the fact comes out with striking plainness *that as pigs grow older their rate of increase diminishes.* This, to be sure, is a well known truth, and would not be re-stated here, did not the figures at the same time point to another perhaps equally important truth, which is not so well known, viz: that *animals which are put, when rather young, on a system of full feeding, do not maintain their rate, and fall largely behind others put to it in a more mature condition.*

The lessons from this are plain: 1. *The fattening process, to be profitable, must be short; perhaps not longer than two months, if that;* and 2. *Keep the young animals out of the yard or enclosure where you feed for market.* This second

TABLE II.—Increase per 100 pounds of live weight of pigs of different ages and weights for periods of ten days: This table embraces all the animals under experiment, 29 in all.

Age in days: Nov. 16.	192	152	134	78	33
	12.5	2 25.4	2 29.0	2 6.8 †	2 43.8
	13.1	2 28.0	18.8	2 29.0	2 40.0
	15.0	2 37.2	2 40.2		
	15.1	18.5	16.8		
	9.2	12.6	10.8		
		14.3			
Average.....	13.0	15.1	16.5	8.9 †	20.9
Age in days: Nov. 26.	202	162	144	88	43
	13.2	2 29.4	2 39.6	2 26.4	2 124.
	12.5	2 33.4	16.7	2 21.8	2 129.2
	11.9	2 28.4	2 27.2		
	12.8	13.2	17.6		
	11.3	14.2	17.3		
		16.1			
Average.....	12.3	15.0	16.9	12.1	63.3
Age in days: Dec. 6.	212	172	154	98	53
	6.9	2 14.8	2 9.0 †	2 8.2 †	2 69.2
	5.4	2 17.4	13.9	2 17.6	2 58.2
	9.2	2 9.0	2 29.8		
	6.5	6.9	7.5		
	6.2	5.2	7.6		
		7.3			
Average	6.8	6.7	9.7 †	6.5 †	31.9
Age in days: Dec. 16.	222	182	164	108	63
	3.9	2 9.2	2 14.2	2 9.0 †	2 119.2
	3.3	2 19.8	13.5	2 30.4	2 78.4
	8.2	2 33.0	2 22.4		
	5.1	12.4	6.6		
	5.0	7.5	9.2		
		10.0			
Average.....	5.1	10.2	9.4	9.8 †	49.4
Age in days: Dec. 26.	232	192	174	118	73
	8.1	2 22.6	2 15.2	2 4.2 †	2 18.4 †
	6.7	2 13.6	13.3	2 23.0	2 34.0
	8.4	2 18.0	2 20.2		
	6.7	10.5	5.9		
	5.3	6.4	6.5		
		2.3			
Average....	7.0	8.2	8.7	6.8 †	13.1

(†) Sick, and off feed.

TABLE II—*Continued.*

Age in days: Jan. 5.	242	202	184	128	83
	7.0	2 13.4	2 21.0	2 14.8 †	2 3[illegible].6
	15.4	2 4.8 †	15.6	2 28.0	2 33 6
	6.8	2 19.6	2 23.6		
	5.4	8.1	11 7		
	6.2	7.0	8.0		
		9.2			
Average	8.2	6.9 †	11 4	10.7	16.3
Age in days: Jan. 15.	**252**	**212**	**194**	**138**	**93**
	3.7	2 17.8	2 12.6	2 14 4 †	2 43.6
	-0.8 †	2 20.2	8.4	2 14.4 †	2 35 0
	5.3	2 3.0	2 18 0		
	7.7	9 2	9.9		
	4 0	6 1	5.0 †		
		6.8			
Average	5.2 †	7.0	7.7 †	7.2 †	19.6
Age in days: Jan. 25.	**262**	**222**	**204**	**148**	**103**
	6.0	2 14.4	2 16.8	2 20.0	2 36 0
	6.1	2 18.8	9.3	2 14.6 †	2 19.4 †
	8.4	2 23 2	2 22.2		
	7.2	9.6	8.0		
	8 2	5.7	9.7		
		5.9			
Average.....	7.2	8.9	9.4	8.6 †	13.8 †
Age in days: Feb. 4.	**272**	**232**	**214**	**158**	**113**
	5.2	2 13.4	2 10.0	2 14.8	2 33.0
	6.5	2 19.6	10.3	2 26.0	2 22.4
	3.1	2 11.6	2 15.0		
	5.2	5.6	7 8		
	2.4	5.0	4.4 †		
		7.9			
Average.....	4.5	7 0	6.8 †	10.7	13.9
Age in days: Feb. 14.	**282**	**242**	**224**	**168**	**123**
	3.0	2 9.6	2 7 4	2 13.8	2 28.2
	3 6	2 12.8	6.1	2 19.0	2 34.0 †
	2.4	2 5.0	2 10.8		
	4.6	5.3	5.4		
	5.1	3.4 †	2.8 †		
		4.4			
Average....	3.7	4.5 †	4 6 †	8.2	14.1 †

(†) Sick, and off feed.

TABLE III.—Increase per 100 pounds of live weight of pigs of same age after having been in part under full feed: (This is the previous table rearranged).

Number of days under full feed previous to date	9	49	69	9	29	89
Age in days	192	192	191	152	154	158
At date	Nov. 16	Dec. 26	Jan. 15	Nov. 16	Dec. 6	Feb. 4
	12.5	2. 22 6	2. 12 6	2. 25.4	2 9.0 †	2 14 8
	13.1	2. 13.6	8 4	2. 28.0	13.9	2. 26.0
	15.0	2. 18.0	2. 18.0	2. 27.2	2. 29.8	
	15.1	10.5	9.9	18.5	7.5	
	9.2	6.4	5.0	12 6	7.6	
		2.3		14.3		
Average	13.0	8.2	7.7	15 1	9.7 †	10.7
Age in days	202	202	204	162	164	168
	13.2	2. 13.4	2. 16 8	2. 29 4	2. 14.2	2. 13 8
	12.5	2. 4 8 †	9 3	2. 33.4	13.5	2. 19.0
	11.9	2. 19 6	2. 22.2	2. 28.4	2. 22.4	
	12.8	8 1	8.0	13.3	6.6	
	11.3	7.0	9.7	14.2	9.2	
		9 2		16.1		
Average	12 3	6.9 †	9.4	15.0	9.4	8.2
Age in days	212	212	214	172	174	178
	6.9	2. 17.8	2 10 0	2. 14.8	2. 15 2	2. 14.4
	5 4	2 20.2	10.3	2. 17.4	13.3	2. 22.0
	9.2	2. 3.0 †	2. 15.0	2. 9.0	2. 20.2	
	6.5	9.2	7.8	6.9	5.9	
	6.2	6.1	4.4	5.2	6.5	
		6.8		7.3		
Average	6.8	7.0	6.8	6.7	8.7	9.1

Number of days under full feed previous to date	9	154	69	158
		2. 9 0		2. 14.8
		13 9		2. 26.0
Age in days	134	2. 29 8	138	
At date	Nov. 16	7.5	Jan. 15	
		7.6		
	2. 29.0	9.7	2. 14.4	10.7
	18.8		2. 14.4	
	2. 40.2			
	16 8			
	10.8			
Average	16.5		7 2	
Age in days	144		148	
	2. 39.6		2. 20 0	
	16.7		2. 14.6	
	2. 27.2			
	17.6			
	17.3			
	16 9		8.6	

lesson is well observed already, but for a different reason than the one given here: the younger and feebler animals are pushed aside at feeding time by the older and stronger ones and suffer in consequence, yet this is, evidently, the case only where feeding falls short of the animals' ability to eat, and when this point is reached all must get *enough*. It is then that the fact, pointed by the table, manifests itself and, while very close feeding may obviate, in a measure, both difficulties, it is plainly wiser to follow the suggestion made here than to take the risk resulting on the one hand from under-feeding and on the other, which in reality is much more serious, from overfeeding. The facts supporting the two points made are brought out so plainly by the two tables following as to need no further explanations.

COST IN CENTS PER POUND OF GROWTH.

Since the Station paid for the corn and wheat consumed during the trial the same prices, 1 cent a pound for chops, or per bushel 55 cents for wheat and 50 cents for corn, the cost in cents per pound of growth must closely follow the previous table; yet prices are always readily apprehended and, perhaps, better adapted for the practical purposes of this discussion so that a special table can not be without value:

POUNDS OF FOOD FOR ONE POUND OF GROWTH.

A glance at the table reveals peculiar irregularities. While, in a general way, the quantity of food to make one pound of growth increases with the age of the animals, the amount sometimes rises suddenly and irregularly to a strikingly high figure. The food is consumed and yet there is no growth or, in other words, no increase in weight, and to say what becomes of it might be a difficult matter. That it has something to do with a temporary loss of health is plain enough; but to what extent indisposition, whether mere indigestion or febrile affection, is the cause of it, is by no means easy to determine.

It was thought at first that the very cold weather, of which we had during the winter several spells, might account for these sudden rises, but on inspecting a table of the average daily temperatures during the ninety days of experiment, no apparent connection between the two can be traced. While, therefore, cold demands additional food to supply the greater amount of heat needed by the animal body, the irregular and high figures in the case of nearly every one of the animals at some period or periods of trial remain unexplained. As to the feed, wheat makes a good showing; not so much as whole wheat, No. VI, as in that of wheat chops, No. III, IV and V. Potatoes and artichokes, it is plain, are out of the question as a profitable food supply to pigs, unless they could be raised at greatly reduced figures than those assumed here. That this might well be done is not at all unlikely.

TABLE IV.—Pounds of food for 1 pound of increase in live weight for the ten daily and monthly periods:

Lot Number.		November 16.....	November 26.....	December 6.	December 16.....	December 26.....	January 5.....	January 15.....	January 25	February 4.....	February 14.....	First month.....	Second month	Third month.....
I.....		3.2	3.7	5.9	8.1	3.8	4.9	4.9	5.2	5.6	6.8	5.2	4.4	5.8
II.....		3.1	3.3	9.2	6.7	5.2	2.9	9.7	4.9	6.6	8.1	5.3	4.7	6.2
III.....		3.1	3.7	4.9	4.4	4.8	7.6	4.2	3.9	6.0	6.1	4.3	5.2	5.1
IV..... . ..		2.6	4.3	6.8	3.1	4.0	3 4	8.8	3.2	4 2	7.2	4.2	4 5	4.3
V.....		2.6	4.3	4.1	3.4	4.2	3.9	4.1	3.6	4.9	5.5	3.9	4.0	4.5
VI		3.0	3.6	6.0	6.2	5.5	4.7	4.7	5.9	6.2	7.4	4.1	4.9	6.4
VII.....		3.5	3.6	7.1	5.5	7.6	4 7	6.6	4.5	7.7	7.8	5.4	6.1	6 3
VIII	Wheat			4.2	3.5	2.6	2.4	3.4	2.2	4.0	3.1	3.4	3.2	40 days.
	Potats			4 2	9.4	10.2	9.5	13.8	7.3	12.9	8.9	8.0	8.4	
IX.....	Wheat			6.8	2.3	2.4	2 8	2.5	9.7	13.0	5.0	3.3	3 2	40 days.
	Artich			6 8	6.6	9.7	11.1	5 5				7.8	8.6	

TABLE V.—Cost in cents of 1 pound of increase of live weight for the ten daily and monthly periods:

Lot Number.	November 26—Preliminary	November 29	December 6	December 16	December 26	January 5	January 15	January 25	February 4	February 14	First month	Second month	Third month
I	3.05	3.52	5.65	7 73	3.58	4.70	4.72	4.98	5.20	6.50	4.96	4 27	5.50
II	2.98	3.16	8.78	6.04	4.99	2.75	9 23	4.65	6.26	7.74	4.92	4.51	5.92
III	2.98	3.53	4.64	4.15	4.52	7.23	4.00	3 74	5.71	5.81	4.04	4.90	4.87
IV	2.63	4.27	6.77	3.69	4.05	3.37	8.78	3.18	4.17	7.18	4.24	4.53	4.30
V	2 64	4 32	4.09	3.39	4.22	3.86	4.08	3.60	4.95	5.52	3.92	4.05	4.51
VI	2.60	3.19	5.22	5.42	4.75	4.07	4.40	5.22	5.39	6.45	4.27	4.27	5.62
VII	3.05	3.11	6.16	4 77	6.61	4 12	5 75	3.90	6.69	6.81	4.36	5.27	5.45
VIII			3.97	9.82	9.41	8.81	12.66	7.04	12.61	9.04	10.05	10 00	40 days.
IX			10.23	3.96	4.87	8 39	4.25	8.78	11.70	4.47	6.40	6.17	

CONCLUSIONS.

The conclusions are based on the general statement embodied in

TABLE VI.—Statement of results for whole time of trial:

Lot Number.	Weight in pounds.		Increase. Per cent.	Pounds of food for 1 pound of gain.	Cost of food Eaten.	Cost in cents of 1 pound of increase.
	Nov. 16	Feb. 14				
I.....	415.5	787	89.4	5.13	$ 18.14	4.88
II.....	400.5	762	90.2	5.40	$ 18.42	5.09
III.....	412	818	98.5	4.90	$ 18.57	4.58
IV.....	394	894	126.9	4 33	$ 21.77	4.36
V.....	400.5	940	134.7	4.13	$ 22.47	4.17
VI.....	406	768	89.1	5.13	$ 17 06	4.71
VII.....	396.5	730	84.1	5.93	$ 16.62	4.98
VIII.....	521.5	761	45.9	3.30 wheat	$ 22.75	9.50 *
	521.5	881	68.8	8.20 potats	$ 34.12	9.50 ‡
IX.....	528.0	728	37.9	3 25 wheat	$ 13.30	6.65 *
	528.0	828	56.8	8.20 artich	$ 19.95	6.65 ‡

* Two months.
‡ Calculated for three months.

The superiority of wheat over corn for the purposes of feeding, both as to per cent and cost of increase, is clear; it is also also clear that wheat chop is superior to whole wheat, whether the latter be soaked or mixed with bran, or be given clear. Lot V. made the best and cheapest growth, increasing 134.7 per cent in weight, at a cost of 4.17 cents per pound at the comparative high valuations of our food materials. It is true, this lot contained two phenomenal animals, increasing from 124 and 112 pounds at the beginning to 318 and 339 pounds at the end of the trial; but whether this exceptional growth was owing to superiority of breed or feed, wheat chop soaked for thirty-six hours, resulting in steady growth, without sickness and without sudden and ineffectual increase in the food consumed, as previously alluded to, must be left undecided. Next in merit comes lot IV., whose feed was wheat chop fed dry. These two lots exceed all the others and deserve chief consideration on the part of practical feeders.

Wheat chop and bran, lot III., and whole wheat, whether soaked or fed dry, lots VII. and VI., are about equal to corn, lot I. In these four lots, the bran fed amounted to exactly one-fifth by weight of the feed given, and need for this reason not be specially considered. The number of pounds of growth, then, which one bushel has made in the case of wheat and corn is as follows:

One bushel of wheat (*chop, soaked*) made 13.2 pounds of growth.

One bushel of wheat (*chop*) made 12.6 pounds of growth.

One bushel of wheat (*whole*) made 11.4 pounds of growth.

One bushel of corn (*chop*) made 10.3 pounds of growth.

THE NUTRITIVE RATIO.

A simple consideration of the effects of food upon the animal body leads to the conclusion that all are not equally nourishing; the cause of this is a two-fold one: First, all foods do not contain the nutritive elements in the same proportion, and, second, the digestibility of these elements in different foods is different. Now, it is plain that whatever is not digestible, and passes through and out of the body in the same form in which it entered, can have no effect upon growth; it is necessary, therefore, in the valuation of food to determine this digestible portion as well as the proportion of the nutritive elements which it contains. These nutritive elements by common consent are taken to be protein, fat, extractive matter and fibre. If, then, the digestible portion in any feeding stuff of each of these four substances is known, we may form an estimate of its feeding value. These proportions, ascertained by long series of analyses and experiments, are found in the standard publications on the subject and need not be re-stated here.

Now, experience has demonstrated that, to obtain the best results possible, protein must be in a certain proportion to the rest of the nutrients; this proportion, of course, differs for the different kinds and ages of animals, and is given for growing pigs, five or six months old and weighing 135 pounds, more or less, as 1:5. To ascertain, then, the nutritive ratio in any feed, multiply the fat by two and one-half and add the product to the extractive matter and fibre, and divide the sum by the protein, as follows:

Corn, composition of:

7.1 per cent of protein, digestible.

3.6 per cent of fat, digestible.

1.5 per cent of fibre, digestible.

61.5 per cent of extractive matter, digestible.

3.6 multiplied by 2½ equals 9.0, plus 1.5 plus 61.5 equals 72.0.

72.0 divided by 7.1 equals 10.1, the nutritive ratio.

The nutritive ratio, then, is: of

Wheat,	1:6.5.
Corn,	1:10.1.
Bran,	1:4.
Peas,	1:3.2.

It is seen that neither wheat nor corn, clear, are advantageous feeds for growing pigs; even with the proportion of bran used in the experiments the nutritive ratio of the mixtures becomes only 1:6 for wheat and bran, and 1:9 for corn and bran, both leading to waste. Some addition of a highly nitrogenous feed to either is necessary for profitable feeding, and, as a suggestion, peas are taken to compound the feed:

Two parts of wheat and one part of peas give a nutritive ratio of 1:5.4.

Two parts of peas and one part of corn give a nutritive ratio of 1:6.0.

If, in addition, one part of bran be added to each, the nutritive ratio becomes for the former 1:5, and for the latter 1:5.5, either of which would, doubtless, give better results than are here attained, and such as would return a satisfactory profit.

RE-STATEMENT OF RESULTS:

1. *Pigs, with increasing age, diminish their rate of increase.*

2. *Pigs put rather young upon full feed do not maintain their rate of increase, but fall behind others that are older and less long on full feed.*

3. *The fattening process for pigs, to be profitable, must be short; perhaps not longer than two months.*

4. *Wheat as a food for growing pigs is superior to corn, weight for weight.*

5. *Neither wheat nor corn give the best results when fed alone; both should be mixed with a food rich in nitrogen, such as peas.*

6. *Very young pigs cannot be reared at all on a clean wheat diet.*

TABLE VII.—Daily mean temperature in degrees Fahrenheit for the ten days of each period ending at the dates given.

	November 16..	November 26..	December 6...	December 16..	December 26..	January 5.....	January 15...	January 25....	February 4....	February 14...	First month...	Second month.	Third month..
	50	25	48	60	34	14	37	30	10	2			
	42	38	30	50	36	12	34	31	4	15			
	37	24	34	40	44	26	18	48	8	-2			
	26	45	43	39	49	25	18	45	13	-4			
	24	38	42	38	55	24	27	54	8	10			
	40	54	32	38	40	26	16	43	22	13			
	47	39	26	40	38	34	4	32	10	10			
	41	40	36	44	45	26	14	24	6	15			
	62	47	44	46	34	18	20	16	12	15			
	43	59	44	44	28	29	31	20	-4	24			
Average.....	41.2	40.9	37.9	43.9	40.3	23.4	21.9	34.6	8.9	9.8	40.9	28.5	17.8