ROTHAMSTED RESEARCH

Report for 1935

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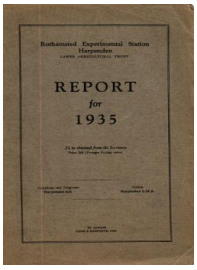

Animal Husbanry Experiments

Rothamsted Research

Rothamsted Research (1936) *Animal Husbanry Experiments ;* Report For 1935, pp 203 - 208 **- DOI: https://doi.org/10.23637/ERADOC-1-67**

PIG EXPERIMENT, 1933-4

Comparison of three levels of rationed feeding and ad. lib. feeding. Effects of differing numbers of pigs per pen (with equal floor space per pig).

ARRANGEMENT

Three randomised blocks of 4 litters of 6 pigs each, sex and litter being equalised as far as possible over the different treatments. Each block contains one pen of 8 pigs (13 ft. x 6 ft. 3 ins.), two pens of 4 pigs (6 ft. 6 ins. x 6 ft. 3 ins.) and 4 pens of 2 pigs (3 ft. 3 ins. x 6 ft. 3 ins.). Each of these sets of pens contains two pigs on each of the four levels of rationing. Pigs were fed individually in small pens (1 ft. 8 ins. x 3 ft. 7 ins.) opening off the main pens. Food consumption and live weights were recorded weekly. At the end of the experiment the pigs were graded for shoulder fat, belly fat and payment.

DETAILS OF ARRANGEMENT

Block and Duration.	Block I (21 weeks)								Block II (21 weeks)								Block III (21 weeks)							
Litter No.	9		33		16		17		30		23		22		44		6		4		3		17	
Age at start (wks.) ..	14.3		13.7		11.3		12.4		13.0		11.1		12.7		14.8		13.9		12.4		12.3		13.0	
Sex	H	G	H	G	H	G	H	G	H	G	H	G	H	G	H	G	H	G	H	G	H	G	H	G
Ration A	–	4	8	2	4	–	2	8	4	2	4	2	8	–	8	–	2	–	4	8	8	4	–	2
Ration B	2	8	–	4	8	2	4	–	8	–	8	–	4	2	4	2	–	2	4	8	8	4	2	–
Ration C	2	8	–	4	8	2	4	–	4	2	4	2	8	–	8	–	8,4		–	2	2	–	8,4	
Ration D	4	–	8	2	–	4	2	8	8	–	8	–	4	2	4	2	4	8	2	–	–	2	8	4

The number 2, 4 or 8 indicates that the pig was one of a pen of 2, 4 or 8 respectively. H denotes hog (i.e., castrated male); G denotes gilt (i.e. female).

TABLE OF RATIONS

Lb. food per week per 10-lb. live weight at beginning of week

	Weeks of Experiment			
	0–5	5–10	10–15	15–20
Ration A	ad lib.	2.1	1.89	1.68
Ration B	ad lib.	2.45	2.17	1.89
Ration C	ad lib.	2.8	2.52	2.24
Ration D	ad lib.	ad lib.	ad lib.	ad lib.

DETAILS

Block	I	II	III	Mean
Commenced	Nov. 30	Jan. 9	Feb. 7	—
Time (weeks)	21	21	21	21
Average age at start (weeks) ..	12.9	12.9	12.9	12.9
Average wt. (lb.) at start ..	44.4	35.1	47.3	42.3
Average wt. (lb.) at end	155.3	156.6	153.6	155.2
Regression of final on initial wt. ..	1.52	2.75	2.76	2.34

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STANDARD ERRORS OF TOTAL LIVE-WEIGHT INCREASE
(Per pig-lb. and per cent. of increase)

Without elimination of differences of initial weight	15.3 lb. or 14.4%
With elimination of differences of initial weight	12.0 lb. or 11.3%

SUMMARY OF RESULTS

	Weeks of Experiment				Mean
	0–5	6–10	11–15	16–20	6–20
	Live weight increase (lb.) per pig				
Ration A	27.8	14.1	18.6	17.7	16.8
Ration B	31.2	21.7	25.0	26.6	24.4
Ration C	28.8	25.6	29.2	31.6	28.7
Ad lib...	27.2	36.1	40.2	47.0	41.1
	Food eaten (lb.) per pig				
Ration A	94.8	78.0	88.2	92.7	86.3
Ration B	99.9	99.9	116.8	124.4	113.7
Ration C	99.6	114.7	137.1	156.7	136.2
Ad lib...	96.8	149.4	182.9	236.6	189.6
	Live weight gain in lb. per 1 lb. food				
Ration A	0.291	0.171	0.208	0.193	0.194
Ration B	0.317	0.218	0.217	0.214	0.214
Ration C	0.287	0.226	0.213	0.204	0.210
Ad lib,..	0.279	0.239	0.230	0.198	0.216
St. errors	0.0105	0.0143	0.0107	0.00964	—

EFFECTS OF NUMBERS IN PEN
Mean final weights per pig adjusted for differences of initial weight

Block	I	II	III	Mean
Two in a pen	155.8	165.3	153.1	158.1
Four in a pen	156.8	143.4	156.5	152.2
Eight in a pen	154.0	158.0	162.8	158.2

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NUMBER OF PIGS IN EACH GRADE
(Classed according to number in pen)

Grade	Belly fat.						Shoulder fat.						Payment					
	H			G			H			G			H			G		
	2	4	8	2	4	8	2	4	8	2	4	8	2	4	8	2	4	8
A	2	3	6	6	4	6	3	2	3	3	5	3	1		1			3
B													2	3	6	8	7	3
C	4	4	9	5	4		4	6	13	8	3	3	3	1	8	1		
D	1	5	1	2	1			5		2	1		1	8	1	4	2	
E		1												1				

NUMBER OF PIGS IN EACH GRADE
(Classed according to ration)

Grade	Belly fat								Shoulder fat								Payment							
	H				G				H				G				H				G			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
A	4	2	3	2	4	3	4	5	1	3	2	2	3	2	3	3		1	1		1	1	1	
B																	4	1	3	3	3	3	5	7
C	3	4	4	6	3	1	3	2	7	4	6	6	3	3	3	5	2	3	3	4	1			
D	2	2	2	1	1	1		1	1	2	1	1	2		1		3	3	2	2	3	1	1	1
E		1																1						

MEAN PAYMENT GRADE.

Sex		Number in pen		Ration	
H	+0.11	2	+0.37	A	+0.18
G	+0.79	4	+0.01	B	+0.29
		8	+0.97	C.	+0.60
				D	+0.43

NOTE: Grade C is taken as the origin in the above table.

Conclusions

In the first five weeks after limitation of feeding commenced, the efficiency of the feeding rates, measured as the live weight gain per 1 lb. food, increased significantly as the level of feeding was raised. In the last ten weeks, however, there was no difference between the efficiencies of the different feeding rates.

Variation of numbers in pen (with equal floor space per pig) had no apparent effect on the live weight increases.

No significant differences in grade were produced by the different feeding rates. The pigs kept eight in a pen were graded significantly higher than those kept two or four in a pen on belly fat and payment. The gilts were graded on the average 0.4 of a point higher on shoulder fat, 0.8 higher on belly fat and 0.7 higher on payment than the hogs, the last two differences being significant.

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PIG EXPERIMENT, 1935-6

Comparison of minimal and liberal green food.
Effect of exercise.
Comparison of fine and coarse grinding of food.
Comparison of ad lib. feeding and limitation of food after 125 lb. weight.

ARRANGEMENT

Four replications, each of two litters of eight pigs, the third order interaction being confounded with litters. Within each litter, the treatments are partially confounded with sex.

TREATMENTS : All combinations of :

$$\left\{\begin{matrix}\text{Minimal green food } (-)\\ \text{Liberal green food } (G)\end{matrix}\right\} \times \left\{\begin{matrix}\text{No exercise } (-)\\ \text{Exercise } (E)\end{matrix}\right\}$$

$$\times \left\{\begin{matrix}\text{Coarse grinding } (-)\\ \text{Fine grinding } (F)\end{matrix}\right\} \times \left\{\begin{matrix}\text{Ad lib. feeding } (-)\\ \text{Limited feeding after 125 lb. } (R)\end{matrix}\right\}$$

Food consumption and live weights were recorded weekly. At the end of the experiment measurements were made of back fat, streak and length of side and the pigs were graded for payment.

FEEDING RATIONS

	Percentage Rations	
	Before 100lb. live weight	After 100lb. live weight
Weatings	50	30
Barley meal	30	50
Flaked maize	10	10
White fishmeal	10	10

Limitation of food commenced when the pig reached 125 lb. live weight. Pigs on limited food consumed on the average about 90 per cent. by weight of the amount of food consumed by pigs with ad lib. feeding.

DETAILS

	Sub-blocks A *				Sub-blocks B *				Mean
	I	II	III	IV	I	II	III	IV	
Commenced ..	July 30	Aug. 2	Sept. 13	Oct.29	July 30	Aug. 2	Sept. 13	Oct. 8	—
Time (weeks) ..	18	18	14	18	18	18	14	18	17
Average age at start (weeks)	11.8	12.8	14.4	12.8	11.8	12.1	13.1	11.0	12.5
Average wt. lb.									
At start ..	40.6	41.2	58.8	42.0	43.2	35.9	53.4	42.4	44.7
At end ..	191.5	175.6	180.8	179.0	206.4	170.2	160.1	169.4	179.1

*For treatments see summary of results below.

https://doi.org/10.23637/ERADOC-1-67

STANDARD ERRORS OF TOTAL LIVE-WEIGHT INCREASE

(Per pig—lb. and per cent. of increase)

Without elimination of differences of initial weight	15.9 lb. or 11.9%
With elimination of differences of initial weight	15.6 lb. or 11.6%

SUMMARY OF RESULTS

Means of individual treatments

Sub-blocks A							
G	E	F	R	GEF	GER	GFR	EFR
Live weight increase (lb.) per pig							
138	136	138	138	130	144	134	131
Food consumed (lb.) per pig							
482	502	501	476	486	496	482	484
Live weight gain in lb. per 1 lb. food							
0.286	0.271	0.275	0.290	0.267	0.290	0.278	0.271

Sub-blocks B							
—	GE	GF	GR	EF	ER	FR	GEFR
Live weight increase (lb.) per pig							
152	124	137	123	143	127	139	117
Food consumed (lb.) per pig							
522	462	465	426	508	449	460	402
Live weight gain in lb. per 1 lb. food							
0.291	0.268	0.295	0.289	0.281	0.283	0.302	0.291

RESPONSES TO TREATMENTS

Mean values : Live weight increase : 134 lb. ; food consumed : 475 lb. ; live weight gain per 1 lb. food : 0.283 lb.

	Live weight increase (lb.) per pig	Food consumed (lb.) per pig	Live weight gain in lb. per 1 lb. food
Liberal green food ..	−7.12[1]	−25.12	0.000
Exercise	−5.88[1]	− 3.12	−0.009
Fine grinding	−1.62[1]	− 3.38	−0.001
Limited feeding after 125 lb.	−5.62[1]	−31.62	+0.008

[1]Standard error, ±3.99

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GRADING FOR PAYMENT

Number of pigs in each grade, classed according to sex and the main treatments

	Hogs		Gilts		Hogs		Gilts	
	O	E	O	E	O	R	O	R
A	2	1	8	7	2	1	8	7
B	3	4	3	6	5	2	2	7
C	3	9	4	1	3	9	4	1
D	5	2	4	1	4	3	3	2
E		1			1			

	Hogs		Gilts		Hogs		Gilts	
	O	F	O	F	O	G	O	G
A	2	1	7	8	1	2	7	8
B	2	5	5	4	3	4	5	4
C	5	7	3	2	6	6	4	1
D	4	3	3	2	4	3	1	4
E	1				1			

MEAN PAYMENT GRADE

Minimal green food	+0.50	Liberal green food	+0.64
No exercise	+0.47	Exercise	+0.70
Coarse grinding	+0.44	Fine grinding	+0.68
Ad lib. feeding	+0.54	Limited feeding after 125 lb. ..	+0.60
Hogs	+0.13	Gilts	+1.01

Note : Grade C is taken as origin in the above table.

RESPONSES TO TREATMENTS

Mean values : Back fat : 1.46 ins. ; streak : 1.52 ins. ; length of side : 30.59 ins.

	Back Fat	Streak	Length of Side
Liberal green food	−0.011	−0.049	−0.234
Exercise	−0.074	−0.056	−0.114
Fine grinding	−0.029	−0.019	+0.109
Limited feeding after 125 lb.	−0.021	−0.014	−0.121
St. errors	±0.0264	±0.0655	±0.176

Conclusions

There were no significant effects of the treatments on live weight increase, efficiency of food utilisation or mean payment grade. Pigs receiving exercise had significantly less back fat than pigs without exercise.

Gilts were graded for payment about 0.9 of a point higher than hogs, the difference being significant.

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