

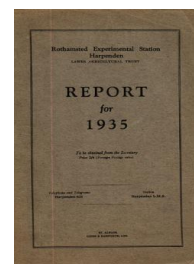
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Animal Husbandry Experiments

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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) | | | |
|------------------------|--------------------|------|------|------|---------------------|------|------|------|----------------------|------|------|------|
| | 9 | 33 | 16 | 17 | 30 | 23 | 22 | 44 | 6 | 4 | 3 | 17 |
| 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 |
| Ration A | - | 4 | 8 | 2 | 4 | - | 2 | 8 | 4 | 2 | 4 | 2 |
| Ration B | 2 | 8 | - | 4 | 8 | 2 | 4 | - | 8 | - | 4 | 2 |
| Ration C | 2 | 8 | - | 4 | 8 | 2 | 4 | - | 4 | 2 | 8 | - |
| Ration D | 4 | - | 8 | 2 | - | 4 | 2 | 8 | 8 | - | 4 | 2 |

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 |
| { at end | 155.3 | 156.6 | 153.6 | 155.2 |
| Regression of final on initial wt. .. | 1.52 | 2.75 | 2.76 | 2.34 |

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 6-20 |
|------------------|--|--------|--------|---------|--------------|
| | 0-5 | 6-10 | 11-15 | 16-20 | |
| | 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 |

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:

$$\left\{ \begin{array}{l} \text{Minimal green food } (-) \\ \text{Liberal green food } (G) \end{array} \right\} \times \left\{ \begin{array}{l} \text{No exercise } (-) \\ \text{Exercise } (E) \end{array} \right\} \\ \times \left\{ \begin{array}{l} \text{Coarse grinding } (-) \\ \text{Fine grinding } (F) \end{array} \right\} \times \left\{ \begin{array}{l} \text{Ad lib. feeding } (-) \\ \text{Limited feeding after 125 lb. } (R) \end{array} \right\}$$

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.

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 |

¹Standard error, ±3.99

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.