



FOR
EGG
PRODUCTION

CONFINEMENT VS RANGE REARING



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University of Missouri
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Missouri Tests Compare the Two Methods

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Three experiments on confinement rearing of pullets have been completed at the University of Missouri covering the years 1955-56, 1956-57, and 1957-58. The general procedure has been to grow all chicks to eight weeks of age in a central brooding house. At eight weeks of age the various breeding groups were randomized in equal numbers for range and confinement rearing. They were grown under these two situations until 22 weeks of age.

Birds on range were provided 10' x 12' range shelters with 125 to 150 birds per shelter. Birds in confinement were allowed 2 3/4 sq. ft. of floor space per bird in pole type shelters. Old built-up litter was used in the brooding rooms, confinement shelter and in the laying pens.

All birds were fed free choice on 20 percent

Reports from Other Experiment Stations

Winter of Ohio reported faster growth rate and earlier sexual maturity with confinement-grown pullets and higher mortality and lower egg production in the laying house. Michigan State University recently reported that confinement-grown pullets were significantly heavier and matured five days earlier on less feed than range-reared birds. The range-reared birds laid at a rate of 50 percent compared to 45 percent for the confinement-reared pullets in the laying house. Livability favored the range-reared bird after housing.

Shift Is Under Way

A shift in the method of growing out pullets has occurred along with the trend toward commercial egg production. At one time virtually all pullets were grown on range. The tendency today is toward confinement rearing.

The reasons for this are rather obvious. Confinement rearing permits permanent installation of buildings and watering and feeding equipment, resulting in much better labor efficiency. It also permits year-round operation of pullet replacement, with the same quarters used to grow out three or more broods per year.

Improved knowledge of nutrition has made confinement rearing possible. The question remains, "Is it good economy to produce pullets in confinement and do they produce as well as pullets grown out on range?"

A considerable amount of data is available for the growing period, comparing range and confinement rearing, but subsequent data on performance in the laying house are rather limited.

protein growing mash, corn and oats during the growing period. At 22 weeks of age, birds were randomized into pens of 200 birds in a 1400-hen laying house, according to date of hatch. Birds were trapped three days per week from 154 to 454 days of age. All production figures were based on individual trapnest records carried on I.B.M. Feed records were obtained only during the growing period. A total of 1238, 1093 and 1929 birds were used in 1955, 1956 and 1957, respectively. There was a wide variation in breeding groups such as crossbreds, strain crosses, hybrids and purebreds but all would be considered of egg type breeding. Equal numbers of each breeding group were given range and confinement treatment.

GROWING PERIOD RESULTS

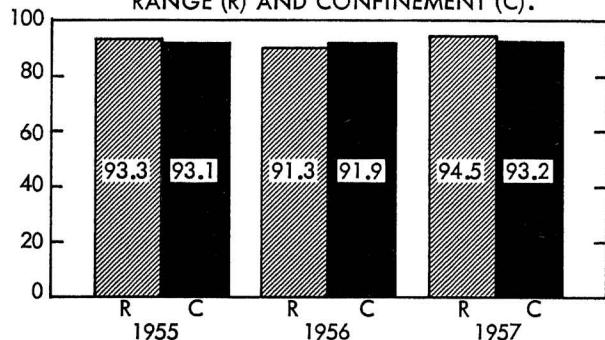
(18 to 22 weeks of age)

Summary of Three Years' Tests

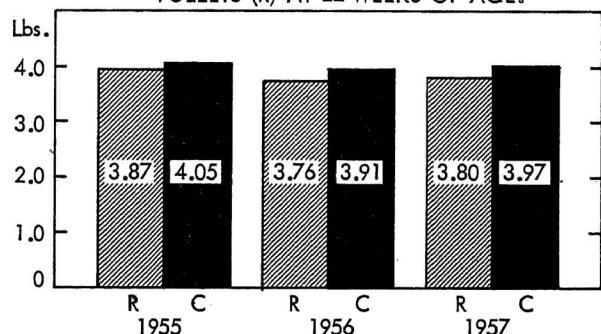
1. During the growing period the losses due to disease were slightly but significantly higher in the confinement-reared birds.
2. Losses from cannibalism were about the same although it was thought necessary to debeak the confined pullets in two of the years when slight outbreaks of feather picking occurred.
3. Though losses from predators were very low on range during these experiments the number of birds missing or unaccounted for was significantly higher on range. This unaccounted loss could have been from either disease or predators. In

	Range		Confinement	
	No.	%	No.	%
Females at 8 weeks	2170	100.0	2080	100.0
Dead - disease	61	2.8	104	5.0
Dead - cannibalism	18	0.8	16	0.8
Missing - unaccounted	32	1.5	9	0.4
Unfit to house	35	1.6	19	0.9
Total losses	146	6.7	148	7.1
Suitable to house	2022	93.3	1916	92.9
Average wt. at 8 weeks	1.53 lb.		1.54 lb.	
Average wt. at 22 weeks	3.81 lb.		3.98 lb.	
Sexual maturity	177 days		173 days	

NO SIGNIFICANT DIFFERENCE WAS FOUND IN PERCENT PULLETS SUITABLE TO HOUSE FROM RANGE (R) AND CONFINEMENT (C).



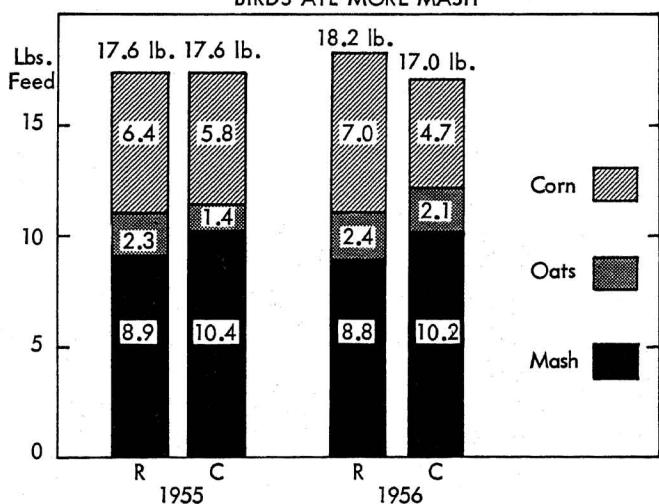
CONFINEMENT REARED PULETS (C) WERE SIGNIFICANTLY HEAVIER THAN RANGE REARED PULETS (R) AT 22 WEEKS OF AGE.



confinement it is much easier to account for every bird.

4. Growth rate was significantly higher (by about 0.16 to 0.18 pound) for the confinement-reared pullets in each of the three years.
5. Sexual maturity was calculated as average age when hens laid their first trapped egg after housing at 154 days of age. This was not early enough to arrive at accurate sexual maturity on some of the confinement-reared pullets. The earlier sexual maturity of 4 days in confinement-reared pullets was probably under-evaluated due to late housing. Sexual maturity was significantly earlier in confinement-grown birds. There are some indications that extremely early sexual maturity is not conducive to the highest annual production and results in a higher percentage of small eggs.

TOTAL FEED CONSUMPTION (8-22 WEEKS) WAS ABOUT THE SAME FOR CONFINEMENT (C) AND RANGE (R) PULETS; CONFINED BIRDS ATE MORE MASH



LAYING HOUSE PERFORMANCE

SUMMARY OF THREE YEARS' TESTS

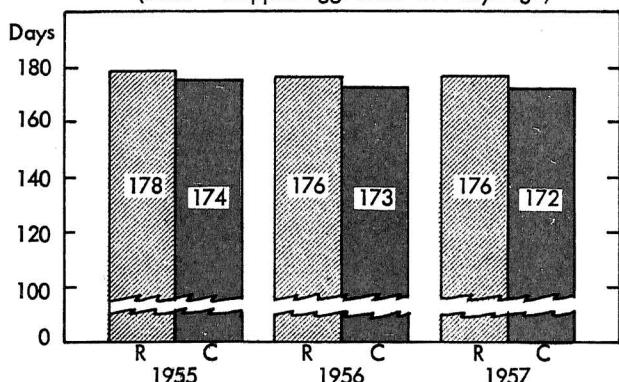
	Range Reared	Confinement Reared	Deviation from "Range"
Number pullets housed	1730	1666	
% Prod. (Part year to Dec. 1)	54.9 %	54.0 %	-0.9 %
Body weight (44 wks. of age)	5.06 lb.	5.06 lb.	-0.03 lb.
Egg weight (Avg. March-April)	26.2 oz.	26.0 oz.	-0.2 oz.
% Prod. - (From 154 to 454 days age)	60.9 %	59.1 %	-1.8 %
% Prod. - (From sexual maturity)	66.7 %	64.2 %	-2.5 %
Adult Mortality	14.2 %	15.0 %	-0.8 %

Data shown in the table indicate:

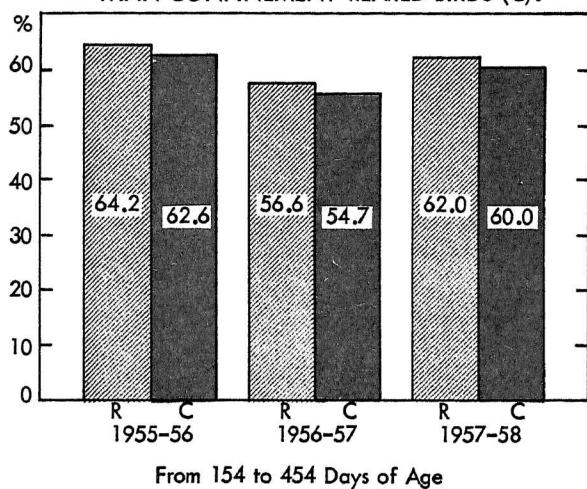
1. The range-reared birds, which were 0.16 to 0.18 pound lighter at 22 weeks of age, were equal in size to the confinement-reared pullets at 44 weeks.
2. March and April egg weights were slightly larger from the range-reared birds. This was not significant. Average egg size for the year was slightly smaller for confinement-reared birds due to earlier sexual maturity.
3. There was a small but consistent advantage in egg production of 0.9% to 2.5% for the range-reared birds compared to confinement-reared birds. This advantage showed up even in part year record to December 1. (About 100 days in laying house). This difference reached its maximum when measured as percent production from sexual maturity.
4. Adult viability favored the range-reared birds slightly but was not consistent by years. The difference was too small to be significant.
5. The decline in both range and confined birds' adult mortality in each succeeding year of the experiment is of interest. The first year the birds were housed in a new building with new litter; an old litter system followed in subsequent years. Since the breeding groups were not the same each year no great significance can be attached to this.
6. Confinement rearing tended to reduce rate of lay. (See bottom graph, opposite page.) Only 55.3 percent of the confinement reared birds laid at rates over 60 percent, compared to 61.3% of the range reared birds. The same type of distribution was consistent each year of the experiment. Aside from the earlier sexual maturity of the confinement reared birds no explanation is offered.

This distribution has also been observed at the Missouri station for birds housed in cages or compared to floor pens; the floor housed birds show more birds with a higher rate of lay. Feeding high level antibiotic to the birds in the laying houses in the third year's trial appeared to improve the production of the range reared birds to a greater extent than it did that of the confinement reared birds.

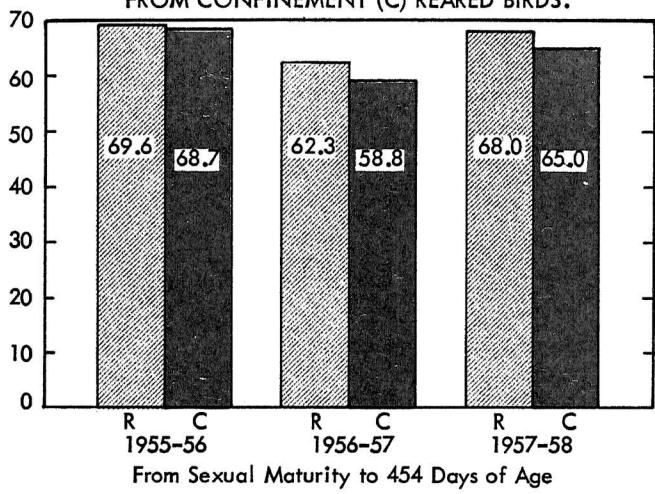
CONFINEMENT REARED PULETS (C) MATURED 3 TO 4 DAYS EARLIER THAN RANGE REARED (R).
(Basis - Trapped eggs after 154 days age)



RANGE REARED PULETS (R) SHOWED SMALL BUT CONSISTENTLY HIGHER EGG PRODUCTION THAN CONFINEMENT-REARED BIRDS (C).

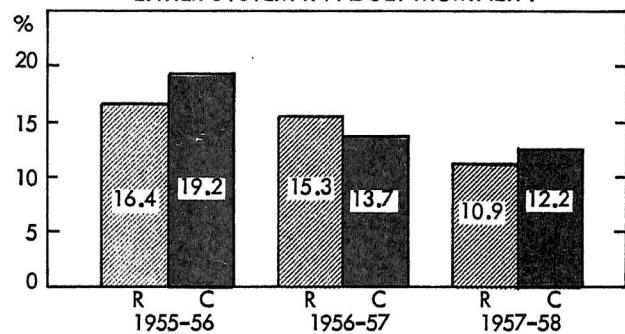


EGG PRODUCTION WAS CONSISTENTLY 1 TO 3 PERCENT GREATER FROM RANGE (R) THAN FROM CONFINEMENT (C) REARED BIRDS.



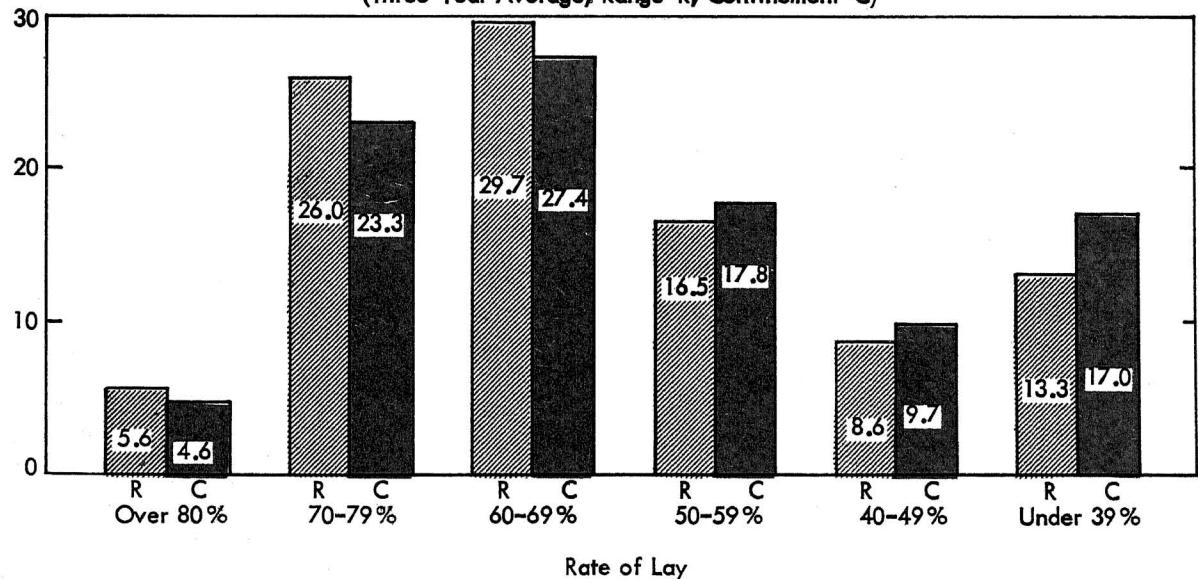
From Sexual Maturity to 454 Days of Age

NO CONSISTANT ADVANTAGE WAS FOUND IN EITHER SYSTEM IN ADULT MORTALITY



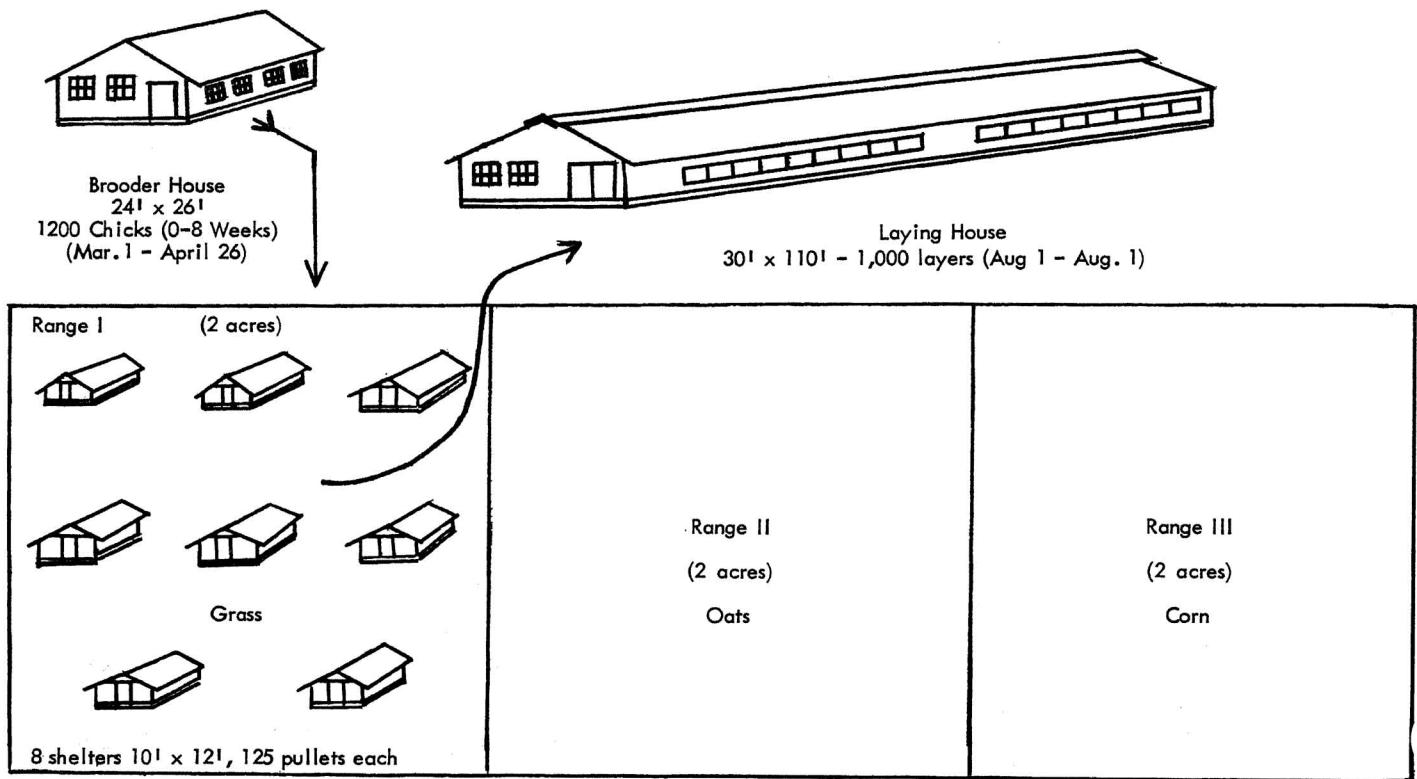
% Population

PERCENTAGES OF PULETS LAYING AT DIFFERENT RATES.
(Three Year Average; Range=R, Confinement=C)



A Comparison of

Single Brood—Range Reared—1000 Hen Flock



ADVANTAGES

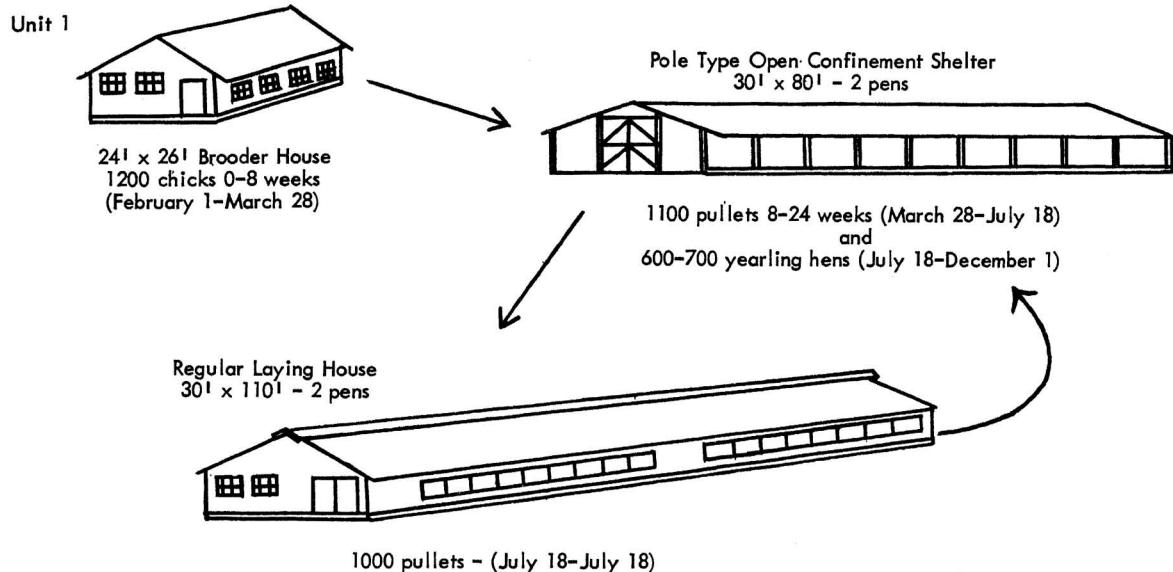
1. Requires less initial investment under single brood system.
2. Produces pullets that lay slightly better once they reach sexual maturity.
3. Less trouble with cannibalism when birds are let out early each day.
4. Slightly larger initial egg size due to later maturity.

DISADVANTAGES

1. Does not provide a place for yearling hens to finish 14 to 16 months of lay.
2. In areas where predators are a problem losses may be excessive.
3. More land is needed for three clean ranges.
4. Much more labor in feeding, watering and moving equipment.
5. Not adaptable to multi-brooding systems.

the Two Systems

Single Brood—Confinement Reared—1000 Hen Flock



ADVANTAGES

1. Requires less land.
2. Saves about 50% on labor of caring for birds.
3. Is adaptable for several broods per year.
4. Under single brood system the shelter can be used for a laying shelter for yearling birds from August to December.
5. Requires no more feed than range rearing.
6. Pullets are under better control of operator. Less predator losses.
7. Allows permanent installation of feeders, waterers and equipment.
8. Better adapted to large scale commercial production.

DISADVANTAGES

1. Pullets mature slightly earlier than desirable for good egg size.
2. Debeaking of growing pullets may be necessary to control cannibalism.
3. Pullets will lay at a slightly lower rate (1 to 3 percent).

A Look at the Future of Egg Production

Egg producers, take a look at the revolution in poultry meat production! It may well indicate the writing on the wall for the egg business.

Twenty years ago chicken fryers and turkeys were produced as sidelines on general farms. Today they are produced almost entirely on a commercial basis.

Improved breeding, nutrition and labor saving equipment made this movement to mass production in poultry meat production possible. While the egg business has been slower to respond, these same economic forces are affecting it and, after a ponderous start, its movement toward specialization appears rapid.

For an indication of what specialization may bring, let's review some poultry statistics. Broiler production jumped from 160 million in 1940 to 1 billion 400 million in 1957. Integration and contract growing have figured in this expansion.

Improved labor efficiency through larger units, confinement rearing and labor saving equipment now permit one man to brood 30,000 to 40,000 broilers per brood, four times per year or to grow out 10,000 turkeys in six months. This efficient production of poultry meats has lowered prices and improved their competitive position in the market, resulting in greater per capita consumption.

In the egg industry, although total flocks producing eggs declined 30% from 1950 to 1954, the flocks with over 3200 hens increased 125 percent.

Missouri egg producers will need large, efficient units to secure suitable market outlets and meet the competition from other areas. The method of growing out pullets for flock replacement is one of the many problems in efficient production. Confinement growing has worked exceedingly well in commercial broiler production.

Can confinement growing replace range rearing of pullets for egg production? This is the subject of investigations reported in this bulletin. If confinement growing is suitable, and it appears to be, new possibilities for improved labor efficiency and decreased capital are available to the commercial egg producer.