

Influence of Feed Withdrawal Time and Broiler Activity on Carcass Yield

R. G. Teeter, A. M. Saleh and J. G. Berry

Story in Brief

Ninety barred rock broilers were studied in a trial to determine the effects of fasting and differing levels of physical activity during the fasting period on broiler carcass characteristics. Physical activity was controlled by regulating the amount of environmental light available to the birds. Treatments included fasting in the presence or absence of light for 0, 12, 24, 36 and 48 hours prior to slaughter. Dressing percentage was enhanced by a mean of 5.7 percent at the 12, 24 and 36-hour time periods, but this effect was reduced to only 2.4 percent at 48 hours after feed withdrawal. Physical activity was reduced by the removal of light, but this had no effect upon carcass yield. Carcass weight remained constant through 24 hours of fasting but declined linearly ($P < .05$) thereafter. Liver weight declined linearly throughout the feed withdrawal period but at 24 hours accounted for only .4 percent of the marketable weight. The data indicates that purchasers of live broilers derive an economic advantage when the broilers are fasted for 12 to 24 hours before tallying purchase weight and that this advantage is reduced when the fasting period is extended beyond 24 hours.

Introduction

Broilers frequently undergo periods of intentional as well as unavoidable fasting prior to processing. Purchasers of live broilers prefer to buy birds that have undergone a period without feed so that dressing percentage will be increased, and they will not be forced to pay live broiler prices for the feed contents of the gastrointestinal tract. Broilers are commonly held off feed but permitted to consume water before the purchase weight is tallied. Unavoidable periods of fasting (without feed and water) are encountered during transit to processing facilities. Although some fasting seems desirable from the purchaser's viewpoint, extensive time periods without feed may reduce the carcass weight. The following experiment was conducted to examine the influence that time without feed prior to slaughter has on the yield of saleable carcass and, further, to determine if bird activity during the deprivation period influences carcass yield.

Materials and Methods

Ninety barred rock cockerels with a mean initial live weight of 3.8 pounds were allocated to one of nine treatment groups. Replicates consisted of two pens of five

birds each. The ration birds received 4 weeks prior to processing is shown in Table 1. Birds were fasted, either in the presence or absence of light, for 0, 12, 24, 36 and 48 hours. Lighting was used to control bird activity. Birds normally exhibit little physical activity when exposed to a dark environment. Presence or absence of light and length of fasting period coupled to form the treatment group. All birds were individually weighed 48 hours prior to and at the time of slaughter. Yield measurements obtained at slaughter included carcass weight (dressed and eviscerated bird weight without giblets) and liver weight. Feed contained in the crop and gizzard was collected, dried, weighed and used as an index of gastrointestinal tract fill.

Table 1. Ration composition

Ingredient	%
Ground corn grain	39.4
Soybean meal (44%)	22.5
Ground milo	14.8
Meat and bone scrap (50%)	10.9
Tallow	4.8
Alfalfa meal	4.0
Blood meal	2.6
Salt	.5
Vitamin mix	.25
dl methionine	.2
Trace mineral	.05

Results and Discussion

Broiler live weight (Table 2) at processing decreased linearly ($P < .05$) as length of fasting period increased. Live weight at slaughter was not influenced ($P > .1$) by the presence or absence of light, indicating that bird activity during the fasting period has little influence on live body weight. Carcass weight remained constant for the first 24 hours of fasting and then declined linearly ($P < .05$) as the fasting duration increased. Since carcass weight remained constant while live weight declined during the first 24 hours, dressing percentage (Figure 1) increased by a mean of 5.4 percent. Fasting birds prior to tallying live body weight results in a savings for the purchaser without reducing the quantity of edible carcass. The 68 percent reduction in crop and gizzard fill indicates that at least a portion of the enhanced dressing percentage is due to a reduced gastrointestinal tract fill. Even though carcass weight was declining after 24 hours of fasting, the dressing percentage remained high through 36 hours, indicating that live body weight and carcass weight are reduced in equal proportions during the 24 to 36-hour fasting period. However, dressing percentage at 48 hours of fasting was reduced ($P < .05$) compared to the 36-hour value, demonstrating that within the latter fasting period, carcass weight is lost at a higher rate than the other tissues included in live body weight. Data from this experiment indicates that in order for the maximum quantity of carcass to be obtained, broilers should not be without food for over 24 hours prior to processing.

A linear ($P < .05$) reduction in liver weight (Table 2) was detected as the length of fasting period increased. Liver tissue is metabolically active and constitutes the

Table 2. Broiler carcass characteristics

	Time before processing without feed (hr)								
	0	12		24		36		48	
	+L	+L	-L	+L	-L	+L	-L	+L	-L
Live wt 48 hr before processing (lb)	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.6	3.8
Live wt at processing	3.9	3.8	3.8	3.7	3.7	3.5	3.5	3.2	3.5
Carcass wt.	2.5	2.5	2.6	2.5	2.5	2.4	2.4	2.1	2.3
Dressing %	64.1	65.8	68.4	67.6	67.6	68.6	68.6	65.6	65.7
Feed Detected in crop + gizzard (oz)	.5 ^a	.1 ^b	.2 ^b	.2 ^b	.1 ^b	.2 ^b	.2 ^b	.1 ^b	.1 ^b
Liver wt (oz)	1.4	1.3	1.3	1.3	1.2	1.2	1.2	1.1	1.1
Liver dry matter %	30.4	28.8	29.8	29.0	28.5	29.3	27.6	28.6	29.7

^{ab}Means in a row with different superscripts differ statistically ($P < .05$).