

RESEARCH REPORT

# Performance of Chantecler chickens on a reduced protein grower ration

**Farmer-Researcher**

Heather Newman  
 D&H Newman Farm  
 Bruce County

## IN A NUTSHELL

Heather compared a standard protein ration with 16% protein to a reduced protein ration with 13% protein to see how her heritage Chantecler chickens responded during the grow-out period.

- In 2019, Heather tracked the weight of three cohorts of chickens, taking more than 1,000 weight measurements of individual chickens.

- There were no consistent differences in the weight of chickens on the two protein rations throughout the grow-out period.
- There was also no detectable effect of reduced protein on finished live weight or dressed weight.
- In 2020, Heather continued to use the reduced protein ration and would like to continue the trial over several seasons for more confidence.

## MOTIVATION

Heather raises Chantecler chickens, a dual purpose bird that is also one of Canada's only heritage breed of chickens (**Photo 1**). Poultry is the lowest earning enterprise on her farm, but she continues to raise Chanteclers in order to keep the genetics of this rare breed alive and for the compost value of chicken manure for her vegetable operation.

Until now, she's raised them on standard commercial rations, but she suspects they have different feed requirements compared to commercial hybrids that are bred for industrial meat or egg production.

Heather was curious to see if Chanteclers grow well with less protein during the grow-out period, which would lower the cost of raising this slow-growing heritage breed. In turn, increased profitability

will help provide evidence that heritage breeds can be a valuable and viable component of mixed farms, and help maintain the genetic diversity of Chanteclers.



**Photo 1.** Chantecler chickens heading out of the coop to pasture.

them a standard starter ration. When the chicks were ready to start the grower ration, she divided each cohort into two equal sized treatment groups by placing a divider in the brooder.

To minimize bias towards males or females in each treatment group, she placed the divider in a way that captured approximately half the chicks at the back of the brooder (i.e. more likely to be female) and half the chicks at the front of the brooder (i.e. more likely to be male). After separation, she counted the number of chicks in each treatment group and adjusted the number of chicks as needed. She then randomly assigned each group to one of the rations. Treatment details are listed in **Table 1**.

## DESIGN

Over the course of the 2019/2020 growing season, Heather raised three cohorts of Chantecler chickens. Until the chicks feathered out, Heather brooded all chicks from a cohort together and fed



**Table 1. Management details for the two feed ration treatments.**

Age Range	Standard	Reduced Protein	Note
0 - 8 weeks	20% protein		Until 8 weeks or when birds are feathered out.
8 weeks - 6 months	Grower 16%	Grower 13%	Transition period of a few days between starter and grower; and then grower until 6 months or fully grown.
6 months+ for hens	Layer ration, 17%		Cockerels will be butchered and pullets will be kept in Heather’s breeding flock or sold as ready-to-lay.

On pasture, Heather grew the two treatment groups in separate pens until she sent the cockerels and culls to the butcher (**Photo 2**). Heather weighed all the birds in the two groups of chickens on a monthly basis throughout the grow out period.

### Feed rations

The standard feed ration was a 16% poultry grower/finisher and the treatment ration was a reduced protein of 13% poultry grower/finisher. The difference in ingredients between the rations was a reduction in soybean content in the 13% grower. Both rations were in pelleted form and Heather fed all the chickens on demand, keeping feed available to them at all times.

## FINDINGS

### Chicken Weight

To evaluate the effect of the grower ration on growth across these dates, we used a statistical model called analysis of variance (ANOVA) with a 95% confidence level to calculate the least significant difference (LSD) that we needed to see among treatments in order to call them “statistically different”. Data is down in **Table 2**. We calculated an LSD of 1.0 lb, such

that the average weight of chickens was considered statistically different on only one date. Live weight of the first cohort on the butcher date was higher for the reduced protein group compared to the group on standard protein ration. Overall, however, there was no detectable weight difference between chickens raised on the two protein rations for both live and dressed weights. See **More on Statistics** for additional information.

Similar growth of birds on 3% less protein may be because the chickens were able to supplement protein by foraging on pasture. Pasture-raised birds forage enough to change the nutritional profile of the meat, as shown in previous studies comparing pasture-raised chicken and birds raised indoors (reference 1).

As a result of this trial Heather used the 13% protein ration for the 2020 season, and she reports that her birds this season are growing nicely. However, she butchered far fewer birds in 2020 because of the increased demand for backyard poultry as a result of the COVID-19 pandemic.



**Photo 2.** Pens that Heather used to roost Chantecler chickens during the grow-out period. She grew the two treatment groups (standard and reduced protein ration) in separate pens.



**Table 2. Weights of three cohorts of Chantecler chickens raised on a standard grower ration (16%) and reduced protein ration (13%).** Unbolded data represents live weights; data in **bold** represents average dressed weights after butcher; and data in **orange** represents a statistically significant difference in weight between protein rations.

	Cohort 1		Cohort 2		Cohort 3	
	16%	13%	16%	13%	16%	13%
Jun 12, 2019	2.9 +/- 0.9 (N=31)	2.5 +/- 0.5 (N=19)	1.5 +/- 0.4 (N=50)	1.6 +/- 0.3 (N=50)	—	—
Jul 29, 2019	4.8 +/- 1.0 (N=33)	4.8 +/- 0.9 (N=17)	3.5 +/- 0.7 (N=55)	3.4 +/- 0.6 (N=36)	1.7 +/- 0.6 (N=26)	1.4 +/- 0.5 (N=26)
Aug 29, 2019	5.5 +/- 1.1 (N=31)	5.6 +/- 0.9 (N=16)	4.0 +/- 1.0 (N=54)	4.0 +/- 0.8 (N=39)	2.7 +/- 0.9 (N=30)	2.2 +/- 0.7 (N=21)
Sep 12, 2019	5.0 +/- 0.4 (N=9)	6.5 +/- 0.9 (N=6)	—	—	—	—
	4.6 +/- 0.8 (N=18)	4.7 +/- 0.6 (N=8)	—	—	—	—
Oct 9, 2019	—	—	5.6 +/- 1.6 (N=45)	5.2 +/- 0.9 (N=30)	4.4 +/- 1.1 (N=26)	4.1 +/- 1.1 (N=23)
Nov 14, 2019	—	—	7.6 +/- 0.5 (N=11)	7.3 +/- 0.5 (N=11)	4.3 +/- 1.0 (N=26)	4.1 +/- 1.1 (N=22)
	—	—	4.2 +/- 1.1 (N=14)	3.8 +/- 0.8 (N=14)	—	—
Jan 15, 2020	—	—	—	—	5.7 +/- 1.2 (N=24)	5.7 +/- 1.2 (N=23)

### Bird Health

Heather observed no differences in growth, health or behaviour between Chanteclers grown on 16% and 13% protein rations.

### Profitability

The trial resulted in cost savings for Heather in two ways.

1. The trial forced Heather to find more efficient ways of feeding. As a result, she switched to bulk feed for both the 16% and 13% grower, which saved her 17% on feed costs and a significant amount of labour.

2. Heather calculated a 4-5% cost savings using the 13% protein grower ration. At Heather's current scale, this amounts to around \$100 in savings a year but would be more if she scales up her operation.



**Photo 3.** A photo of the coops where Heather raises Chantecler chickens on pasture.



### TAKE HOME MESSAGE

Reducing protein from 16% to 13% during the grow-out did not affect weight or health of pasture-raised Chantecler chickens in a noticeable way in this study.

Using a reduced protein ration, Heather saved 4-5% on feed cost and also reduced her dependency on soybean as a protein source.

The process of farmer-led research helped Heather to “evaluate the system to make it more efficient”, as evidenced by switching to bulk feed. Conducting her own research forced Heather to “look at the numbers” and gave her a “good platform” to continue answering her questions on her own.

### NEXT STEPS

Heather used the 13% protein ration for the 2020 season and with the tools she learned as a farmer-researcher, she will continue to explore the feed requirements of her birds. For example, she is considering doing a follow-up trial with an even lower protein ration over a multiple years to get more replicates for the analysis.



**Photo 4.** Painting time! Heather's children helped her paint the coops.

### MORE ON STATISTICS

Using a 95% confidence level means:

- When we measure a difference in weight between the two treatments that is greater than the calculated least significant difference (LSD), we expect this difference would occur 95 times out of 100 and, therefore, consider it a reliable difference.
- When we measure a difference in weight between the two treatments that is less than the calculated LSD, we consider these treatments unreliably different and not statistically different.
- Not detecting a difference does not mean there isn't a difference! There could be a true difference in weight as a result of the protein content, which would be detected with more replicates.

### ACKNOWLEDGEMENTS

We thank Dr. Elijah Kiarie and Dr. Michelle Edwards at the University of Guelph for their help with the design of this project.

### REFERENCES

1. Dal Bosco et al. 2016. Transfer of bioactive compounds from pasture to meat in organic free-range chickens. <https://www.sciencedirect.com/science/article/pii/S0032579119317778?via%3Dihub>.
2. Other references for nutritional differences of pasture-raised poultry can be found at: <https://foodanimalconcernstrust.org/nutritional-benefits>.