

SARE Grant
FNE94-51

Evaluating Hoophouses for ^{rot}Rationally Grazed Turkeys

Final Project Report

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Introduction

Fresh Vermont Turkeys are becoming increasingly popular as a holiday treat. Production increased from approximately 11,500 in 1990 to 21,700 in 1993. There is a growing interest in pastured poultry and the VT Department of Agriculture has recently started a VT Certified Range Program.

Whether turkeys are raised indoors or in stationary fenced pens, problems producers face include disease (hence medicated feed), high feed costs and manure concentration. Turkeys are good grazers and foragers and there is much under utilized pasture in VT. Grazing turkeys may be an economically and environmentally sound venture for farmers with extra pasture who would like to diversify their operations.

Objectives

In conducting this project, I wanted to determine if by grazing turkeys in portable pens and moving them to fresh grass daily, I would be able to; reduce feed costs, use unmedicated feed (important to many of my customers), and improve the pasture or soil for future crops. I also hoped to make use of the pens in the early summer to grow early lettuce for local restaurants and farm members.

Materials and Methods

Three mobile poultry pens (modified from Heifer International plans) were built. The pens were made in a hoop house style with 1" PVC pipe and 2 x 6 pressure treated lumber as skids. The sides were enclosed with three foot high chicken wire and the tops covered with polyethylene and tarps for weather protection. The pens measured 10' x 14', had an open bottom, and were light enough for one person to pull across the pasture using a dolly and 2 sets of wheels placed in notches on the far side of the pen.

One hundred Broad Breasted White turkeys were ordered and arrived as day old poults on June 30, 1994. They were kept as one group in the brooder house and fed unmedicated turkey starter until they were 5 1/2 weeks old. On August 7, the groups were split up in a random manner, with 28 left in the barn (approximately 1000 sq. ft.), and 60 put into two of the hoop houses (30 in each). Both groups were switched to a turkey grower ration and bags of grain consumed during their growth period were counted. The hoop houses were moved daily to fresh pasture between 1-4" tall. To keep the pasture at a reasonable height for the turkeys, sheep were grazed ahead of the turkeys. On 10/8 a third hoop house was added and the pastured turkeys evenly divided to give them more room.

On 9/11 all of the turkeys in each group were weighed to do a live weight to feed consumed comparison. On 11/21-22 all turkeys were processed on the farm and weighed before being picked up by customers.

On 12/5, ten composite 6 " deep soil samples were taken each from grazed or ungrazed areas. This was repeated in two different locations in the pasture.. The soil samples were sent to the UVM soil lab for analysis.

Results

The hoophouses each cost approximately \$150 in materials and about 20 person hours to build. This takes into account using free lumber tarps for shade over the plastic cover (Slide 1).

From 1 day old to 6 weeks old the combined groups of turkeys consumed 800 lbs of turkey starter at a cost of \$108.40. After the initial mortality of 12 poults before the groups were split (several deaths may have been caused by eating sawdust during the first 2 days), the total mortality for the indoor birds was 3 out of 28 (10.7%) and 1/60 (1.7%) for the pastured birds.

At 10 1/2 weeks of age the indoor turkeys had grown larger than the turkeys on pasture (see Table 1), but based on the feed consumed to weight gained ratio, had eaten 12% more grain per pound gained than the pastured turkeys. This does not reflect the amount of starter grain consumed before the groups were split.

At 21 weeks of age, weighing the turkeys after processing showed (Table 2) that the indoor birds still had a higher feed consumed:wt ratio than the birds on pasture, but that it was now only 6% more feed consumed per pound of meat produced. The cost of grain to produce 1 lb. of turkey indoors was 47 cents, while the cost to produce 1 lb of turkey on pasture was 44 cents (This includes the cost of the starter grain). The other important difference noted was that while the average weight of the hens were similar between indoor and pastured birds, the indoor toms were larger than the pastured toms.

Table 1. Results of 9/11 weighing.

	Indoor birds (27)	Pastured birds (59)
Total live weight	249.7 lbs	499.9 lbs
Avg. Wt.	9.2 lbs	8.5 lbs
Turkey grower consumed since splitting groups	400 lbs	700 lbs
Feed:wt ratio	1.6	1.4

Table 2. Results of weighing processed turkeys 11/21-22.

	Indoor birds (25)	Pastured birds (59)
Total weight	520.4 lbs	1056.7 lbs
Avg. Wt. Hens	13.7 lbs	13.5 lbs
Avg. Wt. Tom	24.2 lbs	20.6 lbs
Turkey grower consumed since splitting groups	2300 lbs	4400 lbs
Feed:wt ratio	4.42	4.16

I would estimate that aside from the normal feeding and watering required for each group, it took less than five extra minutes a day to move each pen (this did not take into account the amount of time it takes to get wherever they are being pastured). Bringing water out to the pasture was not a problem for me because I have existing water lines for my sheep. Moving sheep and the electric fence around to accommodate the pens and keep the pasture swath under 4" tall, took about an extra 30 minutes every two weeks. The indoor turkeys were bedded on hay that was allowed to build up in a manure pack. Clean hay was laid on top of the bedding about every ten days. It took about 30 minutes to get the hay and spread it around. The area of the barn where the turkeys were raised still needs to be cleaned out, and I estimate that will take me about 2 hours. Composting and spreading the material will take extra time.

In both parts of the pasture that were tested, the soil that the turkeys had grazed had higher levels of available phosphate, potash, magnesium, and calcium (Table 3). The pH was slightly higher in both areas that had received turkey manure. In both parts of the pasture, the recommended amounts of both phosphate and potash to apply for a mixed vegetable crop was 50 lb/ acre less in the areas that had been grazed by the turkeys.

Table 3. Soil test results from UVM Agricultural Testing Lab (their ratings Low-Medium-High).

	Area 1 - grazed	Area 1 - ungrazed	Area 2 - grazed	Area 2 - ungrazed
Avail phosphate (ppm P)	6.6 High	3.8 Medium	6.8 High	2.2 Medium
Potash (ppm K)	60 Medium	32 Low	44 Medium	26 Low
Magnesium (ppm)	67 Medium	37 Low	50 Low	30 Low
Calcium (ppm Ca)	625 Low	560 Low	570 Low	447 Low
pH (water)	5.9 Low	5.7 Low	5.8 Low	5.6 Low

Economic results

Table 4 is a partial budget for my situation (developed as if I didn't receive the SARE grant, but still raised split groups of turkeys). In my case I get sawdust and mulch hay for bedding for free, so these are not included in the budget. I also did not include processing equipment (which I have for chickens), electricity fro brooding and processing, depreciation on the barn, taxes on the pasture, and electric fencing for predator control (which I have for sheep). If you are not set up to do processing (with at least a scalding and plucker) then add \$7-8 per bird for custom processing, as well as transportation costs. I estimate that the total time I spent on raising, processing and marketing the turkeys at around 130-150 hours. The net returns according to the budget was \$1420.71. This comes out to about \$10/hr, which may or may not be reasonable depending on your attitude towards the type of work and risk involved.

Table 4. Partial Budget for combined groups of birds

Expenses

100 Poults	214.03
Grain (Turkey starter and grower)	871.10
Processing materials (propane, bags, ice)	33.80
Additional labor (besides my own) 48 h. @ \$6	288.00
Cost of 3 Hoophouses / 5 years	90.00
Total	1496.93

Revenue

1577.1 lbs of turkey @ \$1.85/lb	2917.64
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Discussion

The information collected from this project showed that there were several advantages to using the portable hoophouses to raise turkeys on pasture. The turkeys grazed well, and contact with potential disease causing organism in manure was limited by giving them fresh pasture daily. The 6% reduction in feed consumed per pound of turkey produced (in the pastured birds) would come out to approximately \$.57 less for a twenty pound turkey. This is probably not too significant for a small scale producer, but every little bit helps! It was interesting to see that at 10 1/2 weeks, there was a 12 % difference in feed consumption between the pastured and indoor birds and that this difference decreased over time. This may have been because when the pastured birds were smaller, the high quality pasture in the pen lasted longer, coupled with the fact that the colder weather in October and November probably caused the pastured turkeys to burn more grain for maintenance while pasture quality had gone down. Moving the pens more frequently as the birds got larger and/or bringing the turkeys inside during the last few weeks in November may be ways to decrease feed consumption per pound of turkey sold.

Percent mortality was higher in the indoor turkeys even though they had more room to move around. This may have been a coincidence, or it may show that it is less risky using unmedicated grain on turkeys that are being moved daily.

Adding manure to the soil is a side benefit of grazing the turkeys and will undoubtedly benefit the pasture by adding nutrients and organic matter. The 50 lb credits for both potash and phosphorous if vegetables were to be planted is a benefit to the farmer.

One of the disadvantages of this particular method was the limited number of turkeys you could fit in the pens. I felt that the pens I built were at capacity at 20 full grown birds. The fact that the toms raised in the pens were smaller than the toms raised in the barn (who had much more room) was probably due to crowding and fighting in the pens. It was interesting to see that the hens were the same size whether raised indoors or on pasture. I found the turkeys less well adapted to these pens than

the broiler chickens I also raise. The turkeys are more active and seem to require more room to roam. They also tie up the pen for 20 weeks as opposed to 8 weeks for the broilers.

Depending on what other facilities or fencing methods you have available, another disadvantage could be the cost of materials and labor to build the pens. I estimated that building a pen from scratch would cost about \$270 (\$150 in materials and 20 hrs labor @ \$6/hr.). Even with a life expectancy of 5 years, this would come out to a cost of approximately \$2.70/bird raised over the lifetime of the pen (\$270/20 turkeys x 5 yrs.). I will use the pens for early season lettuce production as well as for an early batch of broilers, before the turkeys are put out on pasture. This will make the pens more cost effective for me.

The extra management time moving the pens was negligible in my opinion (it was an enjoyable chore to see the turkeys mowing down the fresh grass when moved), especially when weighed against the time necessary to clean out the barn.

In my case, since this was permanent pasture, I think there was a lot of room for improvement in the rotational grazing scheme. I say this because at times the turkeys were following sheep and were grazing regrowth without an adequate resting time for the pasture. This wouldn't be a problem if the area was to be planted to crops, but from the pasture's point of view the lack of rest between grazings isn't good rotational grazing.

Conclusion

Because I like turkeys and they fit into the overall scheme of things at The Farm Between, I plan on raising 100 turkeys again next year. I am still looking for a better method for containing them on pasture (I haven't had good luck with electric fencing), but I am not optimistic that I will find one. The hoopouses fit into my operation, and I will probably use them again next year for turkeys. I may bring the turkeys into the barn for the last few weeks after the pastures have gone by to reduce grain consumption (the extra grain used for energy against the elements in November) and to reduce the crowding. I will also try to move them more often in response to the amount of pasture they are consuming.

As seen by the partial budget, raising turkeys in Vermont at this level is not highly profitable, but may fit in well to a farm that has some of the necessary infrastructure (pasture, fencing, etc.) and is looking to diversify and spread workload into November.

Outreach (to date)

- On 9/12/94, the UVM Pasture Program and the VT Dept of Agriculture organized a pastured poultry workshop at The Farm Between. Approximately ten people took part in a lively discussion and pasture walk from 10am-12pm.
- WCAX TV in Burlington filmed part of an "Across the Fence" news program featuring pastured poultry at The Farm Between. The program will be shown in 1995.
- I am scheduled to lead a workshop on pastured poultry at the Northeast Organic Farmers Association Winter Conference in Montpelier, VT on 2/25/95. I will present the results of the SARE project as part of my presentation.