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Evaluating the Economic Feasibility of Producing Broilers on Pasture and in a Conventional Production System

Kristina M. Liles Jannette R. Bartlett* Nii O. Tackie Ronique C. Beckford
Department of Agricultural and Environmental Sciences, Tuskegee University, Tuskegee, AL 36088, USA
*E-mail of the corresponding author: jbartlett@mytu.tuskegee.edu

Abstract
The demand for pasture raised poultry is increasing because of the perception that it is healthier and tastier than conventionally raised poultry. In order to meet this demand, some producers are considering switching from the conventional to the pasture system to take advantage of this niche market. Therefore, the objective of the study was to determine the economic viability of rearing broilers in a pastured poultry system (PPS) versus a conventional poultry system (CPS). Each of these systems was replicated three times with 60 birds per treatment in a study lasting seven weeks. Data were collected on costs of inputs, and others estimated. The mean net returns for PPS and CPS were, respectively, $56.44 and -$92.02. The break-even prices were, respectively, $10.89 for PPS and $11.87 for CPS. Also, the benefit/cost ratio was 1.103 for PPS and 0.845 for CPS. The paired t-test for the benefit/cost ratios indicated a significant difference ($p < 0.05$) between PPS and CPS. PPS was deemed more feasible than CPS. Hence, it was recommended that the former system is more appropriate for small and limited resource producers, and that technical assistance should be provided to them regarding PPS.
Keywords: Pastured poultry, Conventional poultry, Economic feasibility, Broilers

1. Introduction

Currently, the United States is the world's largest broiler producing country. In 2013, 8.52 billion broilers were produced (USDA/NASS, 2014a), which yielded approximately 51.5 billion pounds of meat to meet consumers' demand (USDA/NASS, 2014b). These broilers are reared commercially, in an intensive setting allowing several thousand broilers to be raised at one time. However, the demand for pastured poultry has steadily increased in recent years (Fanatico, Cavitt, Pillai, Emmert, & Owens, 2005; Dal Bosco, Mugnai, Sirri, Zamparini, & Castellini, 2010; Smith, Northcutt, & Steinberg, 2012; Holcomb, Willoughby, Early, & Reed, 2013; Chen et al., 2013). With an average annual growth of 20% since 1997, organic food is the fastest-growing segment of the food industry (Ponte et al., 2008a). Pastured poultry is also perceived as producing healthier meat products. The consumption of leguminous pasture was shown to have a positive effect on the fatty acid profile of chicken meat (Ponte et al., 2008b). This is also supported by Enser (2001) who stated that the omega-6 to omega-3 fatty acid ratio (n-6/n-3 ratio) is beneficial from animals that consume grass. Moreover, the health benefits from pastured poultry products are thought to outweigh the additional cost of raising birds. In fact, consumers are willing to pay premium prices for natural and organic meat (Ennis, Jefferson-Moore & Bynum, 2007; Holcomb et al., 2013) thus, supporting a specialty market. While pasture reared broilers can be sold at premium prices, there may be limited revenue due to available space on pasture. Because pens are rotated on pasture providing birds with fresh forage daily, time must be allotted for grasses to replenish without being disturbed. This in turn, may limit the amount of potential income for the producer compared to conventional reared broilers. There has been limited research on comparing the feasibility of economically raising broilers using the pastured production system versus the conventional production system. Thus, the objective of this study was to determine the economic viability of rearing broilers in a pastured poultry system (PPS) versus a conventional poultry system (CPS). The significance of conducting such a study is the possible attractiveness of either system to the small and limited resource producer.

2. Literature Review

Start-up costs for a pastured poultry system are relatively low with feed and livestock purchases accounting for 57% and 21%, respectively (Fukumoto & Replogle, 1999). Portable field pens, such as those created and popularized by Joel Salatin, are considered the least expensive housing structures for this system. Making a 10-foot-by-12-foot pen capable of holding up to eighty mature broilers is estimated to cost, at most, $400. Moreover, using salvage materials can reduce this cost. Basic brooders, with a capacity for approximately 250 chicks, can be built for roughly $100. Feeders and drinkers can be bought or homemade to further reduce expenses (Berton, Mudd, & Spencer, 2012). Feed expenses can also be minimized by a PPS that allows broilers to forage on insects, grasses, and seeds. Producers estimate anywhere from 5-25% of intake being supplied by foraging. Inoculations, antibiotics, and feed additives are not required for pasture raised broilers because respiratory illnesses are less common due to the lack of ammonia and dust found in confined houses. In addition, labor expenses are at a minimum as a result of family members performing the majority of the work (Berton et al., 2012).

In contrast, start-up costs for a commercial production system is quite expensive. The cost associated with facilities and equipment is one of the largest factors in the overall expenses of the broiler operation. Berton et al. (2012) stated that houses capable of holding at least 25,000 birds cost as much as $140,000. Moreover, the cost of a broiler house will vary with size and specifications. Constructing a fully equipped house is estimated to cost approximately $13.00 per square foot, excluding the cost of land. Other major expenses associated with commercial production systems include fuel, labor, repairs, utilities, loans, interest, taxes and feed; all of which vary depending on size of the house (Doye, Freking, Payne & Ferrell, 2006).

Apart from regular expenses, bird loss is another major influence on financial success (Fukumoto & Replogle, 1999). Shipping and predation (Fukumoto & Replogle, 1999; Teske, 2003; Berton et al., 2012) are two primary causes for mortality in pasture production systems, while stocking density and stress are two primary causes for decreased profits in conventional production systems (Imaeda, 2000; Heckert, Estevez, Russek-Cohen & Pettit-Riley, 2002; Bartlett and Smith, 2003; Estevez, 2007; Guardia et al., 2011). Chicks are typically air-freighted and then shipped by trucks to the final destination. Therefore, any delay in arrival can be crucial for a chick's survival. Moreover, because of their small size, chickens are a common prey for most predators. Being confined in a pen protects chickens from daytime predators; however, nocturnal predators will exploit every possible opening providing access to the birds. Thus, guard dogs and perimeter fencing are often used (Berton et al., 2012). In conventional production systems, negative associations are correlated with high stocking densities. Having such a limited amount of space per bird can cause heavy adverse effects on performance characteristics, welfare, and behavior (Imaeda, 2000). Other stressors, such as heat, can also lead to a decrease in performance (Bartlett and Smith, 2003; Niu, Liu, Yan & Li, 2009).

Stevenson & Schuster (2003) investigated market prices for large-scale pastured poultry farming. The average on-farm processing was determined to be $1.17 per bird, while off-farm processing ranged from $1-$4 per bird. If 4,000-10,000 birds were sold, the gross income per bird was $7.30; whereas, if over 10,000 birds were sold, the gross income per bird increased to $8.61. Teske (2003) reared pasture broilers for eight weeks with a desired dressed bird weight of 3.75 pounds. The income calculations were based on a 200-bird batch with a 15% mortality rate. Thus, 170 birds were sold at $8.73 per bird generating $1,484 in revenue. Fukumoto & Replogle (1999) also reared birds until 8 weeks, allowing broilers 4 weeks with pasture access. Economic summary was based on a 100-bird batch. Average total expenses were $512; average income was $656, with birds priced at $8 per bird, yielding a net return of $144. Although birds were sold for $8, the break-even price was $6.26 per bird. Hamra (2010) evaluated the possible profitability of a conventional poultry operating system based on 3,060 birds, and calculated total production costs to be $10,479. This included rental costs, labor salaries, electrical costs and other miscellaneous costs. Chicken meat was sold for $3.10/kg, a total of 4,428 kg was sold for $13,726.80, yielding a net profit of $3,247.80. Moreover, Doye et al. (2006) explained how, commercially, approximately five to six flocks can be grown per year. From a five-flock production with broilers reaching an approximate 6 lb. weight, the contract price per pound was $0.0585 with a 94% of usable broiler product. As a result, gross broiler sales averaged $47,432 using a 26,400 bird building.

3. Methods and Procedures

3.1 Experimental Birds, Diet, and Housing

This research was conducted at the Poultry Unit of the George Washington Carver Agricultural Experimental Station at Tuskegee University in Tuskegee, Alabama. The study was performed during the summer of 2013 from June 17 to August 5. Three hundred and sixty 1-day-old male Cornish Rock broilers were purchased from Murray McMurray Hatcheries (P.O Box 458, 191 Closz Dr., Webster City, Iowa 50595). Upon arrival, the chicks were wing-banded for identification, weighed, and randomly assigned to one of six pens prepared for brooding. Brooding pens were approximately 12 ft x 14 ft (3.66 m x 4.27 m). Each pen contained a 250-Watt infrared fluorescent brooding lamp to provide the chicks with adequate heat. Pens also contained bedding material (wood shavings) laid down approximately three inches thick to provide cushioning for the chicks. In addition, chick feeders and drinkers were placed in each pen. A commercial broiler ration, Nutrena® NatureWise Meat birds crumble feed (P.O. Box 5614, Minneapolis MN, 55440), purchased from H. A. Vaughan Feed Store (106 West Lee Street, Tuskegee, Alabama 36083) was fed to the birds through the duration of the study. Feed and water were provided ad libitum to the birds. Table 1 shows the chemical composition of the feed offered.

Table1. Chemical composition of diet

Macronutrient	Value
Crude Protein (%)	22.0
Lysine (%)	1.0
Methionine (%)	0.37
Crude Fat (%)	2.5
Crude Fiber (%)	6.0
Calcium (%)	0.9 - 1.4
Phosphorus (%)	0.6
Salt (%)	0.25 - 0.65
Sodium (%)	0.15 - 0.22

*Chemical composition as listed on label of feed bag

3.2 Experimental Procedure

This study utilized two treatments, the pastured poultry production system (PPS) and the conventional production system (CPS). Each treatment was replicated three times (60 birds per replication = 180 birds per treatment = 360 total). The birds were randomly assigned to treatment groups and brooded indoors for three weeks. After brooding, one treatment was moved into three polyvinyl chloride (PVC) pens on pasture while the other treatment remained in three indoor pens. The indoor pens were modified to be similar in size to the PVC pens measuring 10 ft x 12 ft (3.05 m x 3.66 m). The PVC pens were approximately 3 ft high (0.9 m) with wire fencing around all sides. A tarp covered approximately two-thirds of the top of the pen providing shade and shelter for the birds. Access into the PVC pens was available via a top, swinging door. All pens were equipped with hanging feeders and automatic drinkers. Weights and feed intake were recorded on a weekly basis. The study was conducted for a total of 49 days; after that birds were slaughtered.

3.3 Data Collection and Analysis

All purchase costs for birds, vaccinations, feed, materials, and equipment were recorded for evaluation. Labor and utilities used, as well as their costs were estimated. Mortality rate per pen was also recorded.

Enterprise budgets were used to estimate costs and returns for each treatment based on replications. Also, benefit cost analyses were used to estimate benefit/cost ratios for the replications for each system. Finally, paired t-test was used to test if the benefit/cost ratios for the two systems were significantly different from each other. Enterprise budgets are planning tools used to estimate costs and returns for different enterprises. Benefit/cost analyses are used to ascertain the relative benefits and costs for specific projects in order to make decisions about the projects.

4. Results and Discussion

Table 2 shows the results for the enterprise budget for PPS Pen 1. The estimated total returns were $600.00 and the total variable costs were estimated to be $476.39. The latter comprise costs for chicks, feed, litter, vaccination, and labor; the returns above variable costs were, therefore, $123.61. The total fixed costs, which included start-up investment, start-up on-farm processing cost, and general overhead, were $71.73 (see Appendix). The total cost was $548.12, net returns were $51.88, and the break-even price per bird was estimated to be $10.96.

Table 2. Enterprise Budget for Pastured Poultry, Pen 1 (Bird Basis), 60 birds

Item	Unit	Quantity	Price or Cost/Unit ($)	Total ($)
Gross Returns				
Birds	#	50.00	12.00	600.00
Total Returns:				600.00
Variable Costs				
Chicks	#	60.00	1.96	117.60
Feed	bag	14.91	15.25	227.38
Bedding Litter	bag	4.00	8.25	33.00
Vaccination	#	60.00	0.16	9.60
Labor	hr	12.25	7.25	88.81
Total Variable Costs:				476.39
Returns Above Variable Costs:				123.61
Fixed Costs				
Start-up Investment				32.31
Startup On-Farm Processing				19.82
General Overhead				19.60
Total Fixed Costs:	Batch	1	19.60	71.73
Total Cost:				548.12
Net Returns:				51.88
Break-even Analysis				
Break-even Price/Bird				10.96

*17% mortality rate for 60 birds

Table 3 shows the results for the enterprise budget for PPS Pen 2. The estimated total returns were $636.00 and the total variable costs were estimated to be $476.54. As a result, the returns above variable cost were $159.46. The fixed costs were $71.73 (see Appendix 1); the total cost was $548.27, net returns were $87.73, and the break-even price per bird was estimated to be $10.34.

Table 3. Enterprise Budget for Pastured Poultry, Pen 2 (Bird Basis), 60 birds

Item	Unit	Quantity	Price or Cost/Unit ($)	Total ($)
Gross Returns				
Birds	#	53.00	12.00	636.00
Total Returns:				636.00
Variable Costs				
Chicks	#	60.00	1.96	117.60
Feed	bag	14.92	15.25	227.53
Bedding Litter	bag	4.00	8.25	33.00
Vaccination	#	60.00	0.16	9.60
Labor	hr	12.25	7.25	88.81
Total Variable Costs:				476.54
Returns Above Variable Costs:				159.46
Fixed Costs				
Start-up Investment				32.31
Startup On-Farm Processing				19.82
General Overhead	Batch	1	19.60	19.60
Total Fixed Costs:				71.73
Total Cost:				548.27
Net Returns:				87.73
Break-even Analysis				
Break-even Price/Bird				10.34

*12% mortality rate for 60 birds

Table 4 presents the results for the enterprise budget for PPS Pen 3. The estimated total returns were $576.00 and the estimated total variable costs were $474.56; thus, the returns above variable costs were $101.44. The fixed costs were $71.73 (see Appendix), making the total cost $546.29. The net returns were $29.71 and the break-even price per bird was $11.38. The mean break-even price per bird for the three pasture poultry pens was $10.89.

Table 4. Enterprise Budget for Pastured Poultry, Pen 3 (Bird Basis), 60 birds

Item	Unit	Quantity	Price or Cost/Unit ($)	Total ($)
Gross Returns				
Birds	#	48.00	12.00	576.00
Total Returns:				576.00
Variable Costs				
Chicks	#	60.00	1.96	117.60
Feed	bag	14.79	15.25	225.55
Bedding Litter	bag	4.00	8.25	33.00
Vaccination	#	60.00	0.16	9.60
Labor	hr	12.25	7.25	88.81
Total Variable Costs:				474.56
Returns Above Variable Costs:				101.44
Fixed Costs				
Start-up Investment				32.31
Startup On-Farm Processing				19.82
General Overhead	Batch	1	19.60	19.60
Total Fixed Costs:				71.73
Total Cost:				546.29
Net Returns:				29.71
Break-even Analysis				
Break-even Price/Bird				11.38

*20% mortality rate for 60 birds

Table 5 presents the results for the enterprise budget for CPS Pen 1. The total returns were estimated to be $490.00 and the total variable costs were estimated to be $570.09. As a result, the returns above variable costs were -$80.09. The fixed costs were $55.82 (see Appendix), the total cost was $625.91, net returns were -$135.91, a loss, and the break-even price per bird was estimated to be $12.77.

Table 5. Enterprise Budget for Conventional Poultry, Pen 1 (Bird Basis), 60 birds

Item	Unit	Quantity	Price or Cost/Unit ($)	Total ($)
Gross Returns				
Birds	#	49.00	10.00	490.00
Total Returns:				490.00
Variable Costs				
Chicks	#	60.00	1.96	117.60
Feed	bag	15.23	15.25	232.26
Bedding Litter	bag	4.00	8.25	33.00
Vaccination	#	60.00	0.16	9.60
Labor	hr	24.50	7.25	177.63
Total Variable Costs:				570.09
Returns Above Variable Costs:				(80.09)
Fixed Costs				
Start-up Investment				10.80
Startup On-Farm Processing				19.82
General Overhead	Batch	1	25.20	25.20
Total Fixed Costs:				55.82
Total Cost:				625.91
Net Returns:				(135.91)
Break-even Analysis				
Break-even Price/Bird				12.77

*18% mortality rate for 60 birds

Table 6 depicts the results for the enterprise budget for CPS Pen 2. The estimated total returns were $480.00 and the estimated total variable costs were $504.45; thus, the returns above variable cost were -$24.45. The fixed costs were $55.82 (see Appendix), making the total cost $560.27. The net returns were -$80.27, reflecting a loss, and the break-even price per bird was $11.67.

Table 6. Enterprise Budget for Conventional Poultry, Pen 2 (Bird Basis), 60 birds

Item	Unit	Quantity	Price or Cost/Unit ($)	Total ($)
Gross Returns				
Birds	#	48.00	10.00	480.00
Total Returns:				480.00
Variable Costs				
Chicks	#	60.00	1.96	117.60
Feed	bag	14.86	15.25	226.62
Bedding Litter	bag	4.00	8.25	33.00
Vaccination	#	60.00	0.16	9.60
Labor	hr	24.50	7.25	177.63
Total Variable Costs:				504.45
Returns Above Variable Costs:				(24.45)
Fixed Costs				10.80
Start-up Investment				
Startup On-Farm Processing				19.82
General Overhead	Batch	1	25.20	25.20
Total Fixed Costs:				55.82
Total Cost:				560.27
Net Returns:				(80.27)
Break-even Analysis				
Break-even Price/Bird				11.67

*20% mortality rate for 60 birds

Table 7 depicts the results for the enterprise budget for CPS Pen 3. The estimated total returns were $510.00 and the total variable costs were estimated to be $514.05. The returns above variable costs were -$4.05. The fixed costs were $55.82 (see Appendix), the total cost was $569.87, net returns were -$59.87, again reflecting a loss, and the estimated break-even price per bird was $11.17. The mean breakeven price for the three conventional poultry pens was $11.87.

Table 7. Enterprise Budget for Conventional Poultry, Pen 3 (Bird Basis), 60 birds

Item	Unit	Quantity	Price or Cost/Unit ($)	Total ($)
Gross Returns				
Birds	#	51.00	10.00	510.00
Total Returns:				510.00
Variable Costs				
Chicks	#	60.00	1.96	117.60
Feed	bag	15.49	15.25	236.22
Bedding Litter	bag	4.00	8.25	33.00
Vaccination	#	60.00	0.16	9.60
Labor	hr	24.50	7.25	177.63
Total Variable Costs:				514.05
Returns Above Variable Costs:				(4.05)
Fixed Costs				
Start-up Investment				10.80
Startup On-Farm Processing				19.82
General Overhead	Batch	1	25.20	25.20
Total Fixed Costs:				55.82
Total Cost:				569.87
Net Returns:				(59.87)
Break-even Analysis				
Break-even Price/Bird				11.17

*15% mortality rate for 60 birds

The mean break-even price of $10.89 per bird for PPS was lower than the mean break-even price of $11.87 per bird for CPS. The lower mean break-even price per bird for PPS is explained by PPS's lower costs. Similarly, the sales price per bird of $12.00 for PPS is higher than the sale price per bird of $10.00 for CPS. In this case, the difference is explained by the premium price (20%) placed on birds raised using PPS. The mean break-even prices in this study were higher than that obtained by Fukumoto & Replogle (1999) who reported a break-even price of $6.26 per bird. Also, the estimated sale price for poultry in this study was higher than those reported by Fukumoto & Replogle (1999), $8.00 per bird; Teske (2003), $8.73 per bird; and Hamra (2010), $7.30 per bird if at most 10,000 birds were sold, and $8.61 per bird if more than 10,000 birds were sold. The differences may be attributed to differences in costs of production and situations.

What's more, if we assume that a conventionally raised bird on average weighs 6 pounds at sale, it will be sold at $1.67/lb ($10/6lbs). The $1.67/lb for CPS is higher than that for Hamra (2010) who reported birds raised conventionally were being sold for $3.10/kg (or $1.41/lb). However, it is lower than that reported by Doyle et al. (2006) who reported $1.80/lb for birds raised conventionally. Again the differences may be due to differences in costs of production and situations. In general, PPS prices are higher than CPS prices due mainly to premium prices for the former.

Table 8 reflects the benefit/cost ratios by pens for the pastured poultry system. The benefit/cost ratio for Pen 1 was 1.095; Pen 2 was 1.160; and Pen 3 was 1.054. Similarly, Table 9 depicts the benefit/cost ratios by pens for the conventional poultry system. The benefit/cost ratio for Pen 1 was 0.783; for Pen 2 was 0.857; and for Pen 3 was 0.895. A close examination of the two sets of ratios indicated that PPS was more viable than CPS, because of the former's higher benefit/cost ratios.

Table 8. Benefit/Cost Ratios (B/CR) by Pens, Pasture System

B/CR_i	Benefit (TR)	Cost (TC)	Ratio
B/CR_1	600.00	548.12	1.095
B/CR_2	636.00	548.27	1.160
B/CR_3	576.00	546.29	1.054

TR = Total Returns; TC = Total Cost

Table 9. Benefit/Cost Ratios (B/CR) by Pens, Conventional System

B/CR_i	Benefit (TR)	Cost (TC)	Ratio
B/CR_1	490.00	625.91	0.783
B/CR_2	480.00	560.27	0.857
B/CR_3	510.00	569.87	0.895

TR = Total Returns; TC = Total Cost

Table 10 shows the paired t-test result for the two poultry systems. It revealed that there was a statistical difference ($p< 0.05$) between the two systems, confirming that PPS is more viable than CPS for small-scale producers. Furthermore, when comparing studies that use PPS or CPS, pasture systems generally yield more profit, because of premium prices (Holcomb et al., 2013).

Table 10. Paired t-test Results for the Two Poultry Systems

System	B/CR_m	t-value
Pasture Poultry	1.103	5.224**
Conventional Poultry	0.845	

B/CR_m = Benefit/Cost Ratio Mean; ***p* < 0.05

5. Conclusion

The objective of the study was to determine the economic viability of rearing broilers in a pastured poultry system (PPS) versus a conventional poultry system (CPS). Data were collected for the two systems based on cost of inputs and other costs such as labor and utilities, and sale prices were estimated. The data were analyzed using enterprise budgets, benefit cost analyses, and paired t-test. The results revealed that the mean net returns for PPS was $56.44 and that for CPS was -$92.02. The mean break-even price for PPS was $10.89 and the mean break-even price for CPS was $11.87. Furthermore, the mean benefit/cost ratio for PPS was 1.103 and the mean benefit/cost ratio for CPS was 0.84. The paired t-test showed that the difference between these two means was significant.

Based on the above results, PPS was more feasible than CPS. It stands to reason that PPS may be a more realistic option for additional revenue and a source of diversity in production for small and limited resource producers than CPS. Therefore, these producers should be encouraged through educational programs and technical assistance to adopt pastured poultry enterprises as alternative or additional enterprises. Although this study has revealed that PPS is more viable than CPS, further studies are recommended to repeat this study, conduct the study on-farm, and/or increase the experimental period to see if the findings will be confirmed. Along with those recommendations, future studies will also examine the seasonal effects of raising broilers on pasture. This is important because the demand for pasture raised products are growing at such a rapid pace, that year round production may be necessary. It is therefore important to assess the cost of production in each season of the year, so producers can make informed decisions whether it is economically viable to raise broilers all year, or only in certain seasons.

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Appendix

A. Calculations for Pasture Poultry

1. Start-up Investment
a. List items and sum them, $3,116.40 (see "C").
b. Find the present value (PV) annuity for amount ($3,116.40) for estimated life (7 years) at the assumed interest rate (5%), translates to a factor of 5.7864, and divide summed costs by factor.
c. Deflate by 1,000 birds and multiply by batch number, in this case, 60.
Note: 1,000 birds is a standardized enterprise number used in calculating amortized costs (spread of initial investment costs)
$3,116.40/5.7864
= 538.57/1,000 (60)
= $32.31

2. Start-up On-Farm Processing
Same principle as "1" (see "C")

$1,911.38/5.7864
= 330.32/1,000 (60)
= $19.82

3. General Overhead (i.e., costs that cannot be grouped conveniently or are too small to be itemized). In this case, utilities (electricity, water); telephone; office supplies

Electricity	= 0.20 x 21 days = 4.20
Water	= 0.10 x 49 days = 4.90
Telephone	= 0.05 x 50 calls = 2.50
Office supplies	= 8.00 x 1 factor = 8.00
Total	= $19.60

Break-even price = total cost/quantity (e.g., for Pen 1, $548.12/50)

B. Calculations for Conventional Poultry

1. Start-up Investment
a. List items and sum them, $1,041.40 (see "C").
b. Find the present value (PV) annuity for amount ($1,041.40) for estimated life (7 years) at the assumed interest rate (5%), translates to a factor of 5.7864, and divide summed costs by factor.
c. Deflate by 1,000 birds and multiply by batch number, in this case, 60.
Note: 1,000 birds is a standardized enterprise number used in calculating amortized costs (spread of initial investment costs)

$1,041.40/5.7864
= 179.97/1,000 (60)
= $10.80

2. Start-up On-Farm Processing
Same principle as "1" (see "C")

$1,911.38/5.7864
= 330.32/1,000 (60)
= $19.82

3. General Overhead (i.e., costs that cannot be grouped conveniently or are too small to be itemized). In this case, utilities (electricity, water); telephone; office supplies

Electricity	= 0.20 x 49 days = 9.80
Water	= 0.10 x 49 days = 4.90
Telephone	= 0.05 x 50 calls = 2.50
Office supplies	= 8.00 x 1 factor = 8.00
Total	= $25.20

Break-even price calculations: same principle as in "A"

C. Equipment

1. Start-up Investment

PVC Pens; 3@ $825 each	$2,475.00
Chick feeder; 18@ $3.33 each	59.94
Hanging feeder; 12@ $15.95 each	191.40
Chick drinker top; 18@ $2.21 each	39.78
Chick drinker base; 18@ $2.77 each	49.86
Hanging drinker top; 12@ $12.25 each	147.00
Hanging drinker base; 12@ $7.50 each	90.00
Brooding lamps; 6@ $8.55 each	51.30
Infrared heating bulbs; 6@ 2.02 each	12.12
Total for Pasture	**$3,116.40**
Minus	2,475.00
Equals	$641.40*
Plus housing costs	400.00**
Equals Total for Conventional	**$1,041.40***

2. Start-up for On-Farm Processing

Hanging scale; 1@ $82.00 each	$82.00
Table top scale; 1@ $232.00 each	232.00
Killing cones; 6@ $45.75 each	274.50
Scalder; 1@ $245.00 each	245.00
Defeathering machine; 1@ $659.88 each	659.88
Freezer; 2@ $209.00 each	418.00
Total	**$1,911.38**

*For conventional start-up, investment is $641.40 ($3,116.40 - $2,475.00) plus housing cost for birds, $400** (Tin = $70.00; Wire = $48.00; Wood (board) = $24.00; Wood (posts) = $48.00; Wood (two by four) = $126.00; nails = $3.00; Staples = $1.00; and Labor = $80.00), resulting in total of $1,041.40.

**Costs estimated with the help of a local poultry farmer