Extension
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Mobile Laying Hen Planning Budget

Producing eggs using mobile houses, otherwise known as "chicken tractors" or "egg mobiles," can be a profitable enterprise with low barriers to entry. These lightweight, portable structures provide hens with access to feed, water, shelter and protection from predators while allowing access to forages and insects. Pasture-raised poultry also fertilize the soil and help control harmful insect populations.

Basics of operating chicken tractors on pasture

Chicken tractors come in many shapes and sizes. Entry-level chicken tractors holding fewer than 100 hens can be easily built on the farm (Figure 1). Larger, commercially built models can house several hundred birds and may include automatic feeding, watering, lighting and doors. There is a trade-off between capital and labor needed in the mobile poultry business, and success depends on identifying the right balance.

A well-designed chicken tractor should be lightweight, portable and equipped with a solid roof for shade and shelter, as well as adequate ventilation. Chicken tractors designed for laying hens should have roosting bars and nesting boxes for easy egg collection. Layers can be housed in tractors year-round, so tractors need mobility for relocation to sheltered areas with electrical access for supplemental heating.

The basic chicken tractor design is a floorless shelter that restricts birds to the space within its footprint. Some tractors feature a raised subfloor that allows chickens to roam within a portable electric fence. In this system, the chickens have the shaded area under the tractor for shelter in addition to the indoor area, and managers can move the tractor less frequently by allotting multiple days of grazing area. However, moving this system is more time-consuming because the net wire fence has to be taken down and reconstructed. For operations transporting hens beyond a contiguous field, the raised, fully contained design is preferable because it does not rely on constant ground contact to keep the hens contained. The Mobile Laying Hen Budget workbook (XLSX)[1] provides more detail on the production systems outlined in this budget, and you can customize the facilities and production system to fit your operation.

Figure 1. Mobile houses for laying hens come in a variety of shapes and sizes.

Managing laying hens in chicken tractors is similar to standard small-scale poultry production, with daily feeding, watering and relocation of the tractor. The tractor is moved daily for optimal pasture management. Twice-daily moves may be preferable under certain conditions. The time needed to complete daily activities in and around the tractor varies, but in all cases, efficiency should be pursued to minimize labor costs.

Pasture-based egg production system

This guide details pasture egg production at a small 60-hen scale and a medium 600-hen scale. More detail about the systems listed can be found in the budget workbook. The key differences in these models are their labor and capital intensiveness. The small model uses a home-built tractor made of wood, plastic sheeting and poultry net wire. The medium model uses a commercially built chicken tractor with many automated features, such as photosensitive doors, automatic feeders and waterers, and an egg-gathering system that collects eggs without the operator entering the tractor. Table 1 compares the investment required for each operation, and Table 2 estimates weekly labor needs.

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Table 1. Facility investment used in mobile laying hen budget, in dollars.

	Small-scale (60 hens)		Medium-scale (600 hens)	
Item	**Initial investment**	**Annual cost**	**Initial investment**	**Annual cost**
Mobile house	1,338	215	42,000	4,200
ATV/UTV[1]	3,000	390	7,250	943
Tractor[2]			5,000	533
Feed bin			4,300	387
Water trailer			3,000	300
Feed trailer			3,500	350
Electric fencing	300	78	950	247
Brooder house	344	46	10,548	970
Egg cooler	500	78	4,000	390
Egg baskets	150	18	500	60
Egg candler	40	6		
Egg washer	400	62		
Automatic washer/candler			9,000	810
Total	6,072	893	90,048	7,930

1. 50% allocation of a $6,000 all terrain vehicle (ATV) and $14,500 utility task vehicle (UTV) for the small- and medium-scale budgets, respectively.
2. 20% allocation of a $25,000 used 60 horsepower utility tractor.

Table 2. Labor requirement in mobile laying hen budget, in hours per week.

Activity	Small-scale (60 hens)	Medium-scale (600 hens)
Feeding and watering	0.6	1.0
Egg gathering	1.0	2.0
Egg cleaning and grading	1.5	4.0
Egg handling and packaging	1.0	4.0
Moving chicken tractor	1.0	1.5
Other production tasks	0.4	1.0
Administration and management	0.5	1.0
Total labor requirement	6.0	14.5

The poultry business has become highly concentrated in the last century, and small producers cannot compete with supermarket egg prices due to economies of scale. This budget assumes that all eggs are sold directly to consumers at a premium price. In any case, Missouri law requires that farmers selling eggs be licensed as an egg retailer if eggs are sold on any premise other than the farm where they were produced. If you choose to sell eggs to grocery stores, restaurants, farmers markets or any other retailer or end user, your farm must purchase an egg dealer's license. See Selling Eggs in Missouri FAQ's (PDF)[2] for more information.

Economics of pasture-based egg production

Pasture-based egg operations can be lucrative with the right market access. This budget assumes about 37 weeks of annual laying at 5.25 eggs per hen per week, totaling 187 eggs per hen per year. This level of production does not require supplemental lighting but will require excellent flock management. A laying hen eats about a quarter pound of feed daily. Death loss of 7% is assumed. Hens are culled at 110 weeks and sold live for butchering or backyard flocks. Table 3 provides detailed estimates of income, expenses and profitability of the egg enterprise.

Production assumptions

This model assumes leghorn cross hens are purchased as day-old chicks. The hens are reared in a brooder and then a conventional house until laying age, when they are moved to the tractor. Half of the hens are replaced annually, with spent hens sold at about 110 weeks for backyard flocks or canning. Table 4 outlines key production assumptions of the pasture-based laying hens. Egg pricing and spoilage loss are major drivers of

Table 3. Costs and returns to mobile laying hen enterprise, in dollars.

	Small-scale (60 hens)		Medium-scale (600 hens)	
Item	**Annual total**	**Per dozen**	**Annual total**	**Per dozen**
Income				
Egg sales	4,403.90	4.70	44,048.40	4.70
Cull hens	208.00	0.22	2,104.00	0.22
Total revenue	4,611.90	4.92	46,152.40	4.92
Operating cost				
Feed	899.00	0.96	9,108.25	0.97
Labor	6,084.00	6.49	14,703.00	1.57
Purchased chicks	124.50	0.13	1,245.00	0.13
Brooder operation	235.20	0.25	697.50	0.07
Egg packaging and labeling	702.75	0.75	7,029.00	0.75
Transportation	225.00	0.24	900.00	0.10
Marketing	461.19	0.49	4,615.24	0.49
Maintenance, fuel and utilities	733.92	0.78	4,513.96	0.48
Licensing	40.00	0.04	40.00	0.01
Operating interest	190.11	0.20	857.04	0.09
Total operating cost	9,695.67	10.35	43,708.99	4.66
Ownership cost				
Land use charge	60.00	0.06	600.00	0.06
Facility and equipment ownership	831.82	0.89	7,164.79	0.76
Taxes and insurance	184.48	0.20	1,846.10	0.20
Total ownership cost	1,076.30	1.15	9,610.88	1.03
Total cost	10,771.97	11.50	53,319.87	5.69
Income over operating cost	**–5,083.77**	**–5.43**	**2,443.41**	**0.26**
Income over total cost	**–6,160.07**	**–6.57**	**–7,167.47**	**–0.76**
Return to labor and investment	755.76	0.81	14,700.31	1.57
Breakeven egg price per dozen, less labor and facility cost		4.05		3.29
Breakeven price per dozen		11.50		5.69

profitability. To maximize the quantity of eggs available for sale, it is crucial to minimize spoilage and breakage.

Marketing eggs directly to consumers

Before selling eggs, it is important to understand your target market and how you will reach potential buyers. MU Extension's Intel for Ag Market Intelligence platform[3] can help you assess local demand and consumer preferences to guide your strategy. Once you understand your market, choose a market channel that fits your capacity and goals. Market channels can include farmers markets, on-farm stands, Community Supported Agriculture (CSA) partnerships, local retailers or restaurants, or home delivery or subscription services. To better understand the potential costs associated with these and other market channels, refer to MU Extension publication G647, Refining Market Channel Selections Based on Cost.[4]

Take note of your ability to differentiate your product. Egg sellers often face a saturated market and should use creative packaging and clear messaging to share what makes their product special, including any unique production practices or heritage breeds. Sellers should also invest in attractive yet durable packaging and be prepared to engage with customers and share their farm's

Table 4. Input assumptions in mobile laying hen budget, in dollars.

Activity	Unit	Cost per unit	Small-scale (60 hens)	Medium-scale (600 hens)
Egg sales	per dozen eggs	4.70	937.00	9,372.00
Cull hens	each	8.00	26.00	263.00
Starter feed	50-pound bags	20.00	4.00	32.00
Grower feed	50-pound bags	15.75	12.00	111.00
Bagged layer feed	50-pound bags	15.00	42.00	
Bulk layer feed	tons	320.00		21.00
Labor	hours	19.50	31.20	754.00
Day old chicks	each	4.15	30.00	300.00
Transportation	miles	0.90	250.00	1,000.00
Egg packaging and labeling	per dozen eggs	0.75	937.00	9,372.00
Land expenses	per acre	50.00	1.20	12.00
Interest rate	annual percentage rate	8%	9,505.56	42,851.95
Taxes	percent of revenue	3%	4,611.90	46,152.40
Marketing expenses	percent of revenue	10%	4,611.90	46,152.40

story. Regardless of the product being sold, appealing packaging and strong storytelling skills will help you connect with customers. To build customer relationships and boost sales, invest time and effort in marketing through social media, flyers and other avenues. To learn more about establishing an online presence and leveraging social media, refer to MU Extension publication G6225, Post, Engage, Grow: A Social Media Primer,[5] and to learn how to use social media for sales success, refer to MU Extension publication G6229, Harnessing Social Media to Drive Sales.[6]

Conclusion

Egg production in chicken tractors can be profitable with proper management. Key practices include optimizing labor efficiency, securing quality markets, minimizing facility and equipment ownership costs, and reducing product waste. Download the Mobile Laying Hen Budget workbook (XLSX)[1] to start planning your enterprise. If you are considering producing broilers on pasture, refer to MU Extension publication G742, Mobile Poultry for Meat Planning Budget,[7] and its accompanying budget workbook.

Web addresses

1. extension.missouri.edu/media/wysiwyg/Extensiondata/Pro/AgBusinessPolicyExtension/Docs/mobile-layer-budget.xlsx
2. agriculture.mo.gov/weights/device/pdf/Sales-of-Eggs-and-Licensing-FAQ'S.pdf
3. intelforag.org/market-intelligence
4. extension.missouri.edu/publications/g647
5. extension.missouri.edu/publications/g6225
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