



Hay is a mainstay of most cattle operations, and it makes up a significant portion of expenses, MU ag economist Kevin Moore says. He recommends producers consider all of the costs involved when either putting up their own hay or purchasing it.

Needle in the Haystack

Re-explore hay production strategies and discover profit.

Story & photos by
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It's been said that cattlemen can go broke one of two ways — either purchasing hay or producing it. While this observation is meant to amuse those who know all too well its truths, the complexities of obtaining hay — with its relatively high costs and even higher management requirements — can leave producers with some difficult choices.

The decision whether to produce or purchase hay for a herd requires careful economic analysis, says Kevin Moore, agricultural economist at the University of Missouri (MU). Without it, finding the right answer could be like looking for the proverbial needle in a haystack.

"The costs of hay for winter feed

make up a significant portion of expenses for a cattle producer, so it's important to sit down and consider all the costs involved with putting up your own hay or purchasing it," Moore says. "Each situation is unique, so producers need to really take a good look at their specific production costs and local hay market prices."

Determining the best economic route is becoming especially important in a market complicated by volatile fuel prices, rising machinery costs and changing weather patterns. But, despite the importance of such analyses, Moore says some cattlemen are reluctant to fully evaluate their operations.

"Most of them are going to have a tractor anyway, so a lot of them think, 'Well, I've got this tractor. I've got more grassland than my cows

can support. I've got to manage this spring flush of grass anyway,'" he says. "There's certainly logic in that, but there are additional factors there to consider. A lot of hay producers probably think they're getting more production than what they really are. Once you've done the math, the results may surprise you."

It shocked Dan Snodgrass, anyhow. Snodgrass manages 40 purebred Angus females and 330 Angus-based commercial cows alongside 130 other females at AB Farms near Lathrop, Mo. Hay is fed to almost every animal. Until five years ago the farm produced an average of 1,300-1,400 large round bales per year on approximately 300 acres of designated hay ground. Today, though, Snodgrass purchases about 95% of the hay — almost 900 bales per year of a grass-legume mix

— in addition to stockpiling fescue for winter grazing.

Snodgrass says that, after 23 years of putting up hay, he began to rethink hay production costs when haying season began to interfere with the operation's increasingly demanding artificial insemination (AI) schedule. When it came time to purchase a new baler, he decided to do his own study to determine if they were really saving money by producing hay themselves.

"One day I was thinking about all the purebred cows I needed to AI, and I couldn't get it all done because I needed to go bale hay that day. It struck me that that didn't make good economic sense," he says. "After calling the machinery dealer and seeing what a new baler was going to cost me to trade, I thought there had to be some different alternatives. So, we did a little study that year of what it was actually costing us to put up a bale of hay here ourselves."

During that haying season, Snodgrass and others at AB Farms tracked the number of acres mowed and raked per hour, fuel costs, number of bales per acre, and a host of other factors.

"We figured it actually cost us about \$19 per bale to do it ourselves, and that wasn't including much time for getting the bales picked up and hauled to the barn," he says. "So, I just started checking around with some of our area's suppliers. We found out that we could get about the same quality hay delivered for \$21 a bale. At that point, we decided it was kind of a no-brainer for us."

Today, Snodgrass estimates the operation is saving more than \$7,500 a year by purchasing bales and implementing stockpiling on ground no longer reserved for hay. Plus, he was able to increase cow numbers by 60 head.

Of course, he points out, not everyone will get the same results. "There are situations where I'm sure producing it yourself would be better," he says. "But if a producer was really honest in evaluating his own time and putting a cost on that labor and really getting those direct costs nailed down, I think everybody would really be surprised what it actually costs them to put up a bale of hay."

Sharpen your pencil

To figure that, Moore says, the first step for cattlemen producing their own hay is to calculate all production costs — the true variable and fixed costs, including opportunity costs.

"You really need to look past just the cash outlay and at the full complement of the machinery and equipment and land and labor resources that go into hay production. Then, try to get a handle on yields so you can calculate a cost per ton," he adds.

Bob Wells, Iowa State University ag economics field specialist, helps farmers and ranchers in southeast and south central regions of the state determine the best solutions for their hay needs. Wells says producers sometimes forget to consider costs associated with operating haying equipment and often overestimate their levels of production.

“You can’t forget to include things like machinery and equipment insurance, interest and depreciation, labor, land lease costs, and the establishment cost of a grass over a period of years,” he says. Seed, fertilizer, weed control, grease, fuel, oil, filters, repairs, materials, interest on operating capital, twine and labor are all important considerations as well. Size of the cow herd, number of acres, type of forage, age of machinery and personal preferences also play roles in establishing hay value.

“Of course, all of these factors vary with different locations, so I encourage producers to check with their local Extension service to get a cost-of-production budget,” he says. “That way, they can look at what their costs are going to be for their farms versus what the state average will be. It gives you a target to shoot for and something to compare to.”

Moore says most land-grant universities have easily accessible online production budgets, like Fig. 1, that vary with forage type. In fact, Snodgrass looked online to determine some equipment depreciation figures and view other production budgets to calculate final cost per ton.

Once producers do that, Moore says, “that gives them a pretty good comparison to say, ‘Well, am I comfortable putting up my own hay for this cost? Or is there some opportunity to buy the quality of hay that I want locally and at less cost?’”

In most cases, the decision to purchase may boil down to simple economy-of-scale fundamentals, he adds. With fewer hay acres and fewer head to feed, machinery and other fixed costs are larger on a per acre basis; however, as acreage and number of head requiring feed increases, machinery costs per acre decline.

“My numbers would show that it takes a fairly sizable cow herd or a fairly decent-size operation to produce hay economically,” Moore says.

His analysis for typical Missouri producers shows that an individual would need 61 head of cattle (if feeding 1.7 tons of hay per head per year) to justify putting up hay. “For the state’s many herds of 30 to 40 head, it probably doesn’t pay them to be producing their own hay because hay equipment is expensive,” Moore explains. “It takes a certain, sizable herd to justify having that cost tied up in the

equipment, though the numbers may vary from case to case.”

Production considerations

In Mark Nikkel’s case, the numbers suggest self-production. The Mill Brae Ranch manager oversees more than 300 purebred Angus cows near Maple Hill, Kan. Since he came to the ranch in 1987, Nikkel says they’ve utilized nearby rented land to raise alfalfa for hay. While the cattle run on native bluestem grassland throughout the year, the ranch supplements with about 1,000 large round bales of alfalfa and 500-600 native grass bales per year.

“For the cow numbers we have and being in our area, in a normal year of production we can produce it cheaper than we can buy it,” he says. The crew at Mill Brae utilizes 180 acres of alfalfa and another 500 acres of native grass in the Flint Hills, baling some wheat straw for bedding.

Besides economic incentives, Nikkel says he takes comfort in the fact that he can build a reserve supply of hay by producing it himself.

“You know what kind of supply you have, and you’re not always trying to outguess the market,” he says. “Hay prices vary so much from year to year depending on supply and weather. I can’t imagine buying all of our hay.”

Weather does play an important role in the hay markets, Moore admits.

“Obviously, when we have a drought, all of a sudden the local supplies of hay dry up,” he says. “It makes it more difficult to obtain. Many times you’ll have to go to another region of the country, but then you have transportation costs.”

For Nikkel, that’s significant. “Hay boils down to transportation,” he says. “In drought years you wouldn’t have a local supply, so you would have to have it trucked in from a nondrought area. With as much hay as we need, plus transportation costs and fuel, it just wouldn’t pay for us at this point.”

Nikkel isn’t alone in his concerns. Snodgrass says he even shared similar doubts when deciding whether to purchase his hay.

“One of the big concerns I had when I was making this decision was ‘What do you do in a drought year?’” he notes. “This is something individuals need to look at, depending on what their geographic locations are. You need to see what the availability of hay is on a year-in, year-out basis.”

Wells suggests producers increase their odds of available hay by seeking out a supplier with whom they can work on a long-term basis. “Those people work with you on providing the quality of crop that you need at the time that you need it at a fair and average price.”

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Fig. 1: Cool-season grass hay cost-return budget for northern Missouri

INCOME PER ACRE	Yield level (tons)			Your farm
	2.0	3.0	4.0	
A. Yield per acre	2.0	3.0	4.0	_____
B. Price per ton	\$45.00	\$45.00	\$45.00	_____
C. Net government payment	_____	_____	_____	_____
D. Pasture, 2 AUM @ 6.00	\$12.00	\$12.00	\$12.00	_____
E. Miscellaneous	_____	_____	_____	_____
F. Returns/acre [(A × B) + C + D + E]	\$102.00	\$147.00	\$192.00	_____
COSTS PER ACRE				
1. Seed	\$6.72	\$7.84	\$8.96	_____
2. Herbicide	0.00	0.00	0.00	_____
3. Insecticide/fungicide	0.00	0.00	0.00	_____
4. Fertilizer and lime	32.70	47.02	58.70	_____
5. Crop consulting	0.00	0.00	0.00	_____
6. Crop insurance	0.00	0.00	0.00	_____
7. Drying	0.00	0.00	0.00	_____
8. Miscellaneous	8.00	8.00	8.00	_____
9. Custom hire/ machinery expense	47.32	63.01	79.58	_____
10. Nonmachinery labor	10.00	10.00	10.00	_____
11. Irrigation	_____	_____	_____	_____
a. Labor	0.00	0.00	0.00	_____
b. Fuel and oil	0.00	0.00	0.00	_____
c. Repairs and maintenance	0.00	0.00	0.00	_____
d. Depreciation	0.00	0.00	0.00	_____
e. Interest on equipment	0.00	0.00	0.00	_____
12. Land charge/rent	19.17	22.56	29.04	_____
TOTALS				
G. SUBTOTAL	\$123.91	\$158.43	\$194.28	_____
13. Interest on ½ nonland costs	3.40	4.42	5.37	_____
H. TOTAL COSTS	\$127.31	\$162.85	\$199.65	_____
I. RETURNS OVER COSTS (F – H)	(\$25.31)	(\$15.85)	(\$7.65)	_____
J. TOTAL COSTS PER TON (H ÷ A)	\$63.65	\$54.28	\$49.91	_____
K. RETURN TO ANNUAL COST [(I + 13) ÷ G]	-17.68%	-7.22%	-1.17%	_____

Source: <http://agebb.missouri.edu/mgt/budget/index.htm>.



Size of the cow herd, location, number of acres, type of forage, age of machinery and personal preference all play a role in establishing hay value.

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Machinery and equipment can be costly items for cattlemen producing their own hay. Insurance, interest and depreciation, land lease costs, fertilizer, weed control, repairs, materials, twine or net, and labor are all important considerations as well.

Just like with any row crop, however, that price most often comes back to weather.

“When there’s a shortage, such as in a drought situation, prices will go up,” Moore says. “There’s a little bit of a cyclical nature to it. Prices are going to go up when hay is being used into the winter, and they’re going to go down at harvesttime during late spring and early summer. And, there are those peak years where we see forage prices maybe even double when there’s a severe drought in any particular area.”

But as Wells points out, those who purchase their hay aren’t the only ones who suffer high costs in drought situations. Hay producers take a cut as well.

“If you’re going to be producing your own hay, you’re going to have less tonnage, but you’ll still have the same

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Hay budgeting resources

A multitude of resources are available for cattlemen hoping to evaluate their hay production strategies — you just have to know where to look, says Allen Gahler, Ohio State University Extension educator.

“One of the best resources is a county Extension agent,” he says. “The specialists here in Ohio, for example, update production budgets every few years. They can help producers figure in variable and fixed costs to determine whether it makes more economic sense to keep producing your hay supply or if it would save you money to buy it instead.”

Gahler says production and enterprise budgets and cost analysis worksheets are also available online via most land-grant universities’ Extension Web sites.

“The Internet is a great tool as well. Even if someone’s particular state Extension service doesn’t have things set up like we do, they can always look at forms from Ohio’s site to get an idea of what they need to include in their economic analysis,” Gahler notes.

The Internet also plays a role in the competitiveness of the hay market.

“Farmers and ranchers now have more readily available access to other hay markets with the help of the Internet,” Gahler says. “Most of our hay auctions take place in the northeast part of the state. Producers living further away can get online and find out what hay is going for there and use that to determine a fair price for hay in their own region. They can do their own research to see what a fair hay price is, depending on hay quality.”

The following resources offer example budgets, cost analysis support and even software designed to assist producers in determining the most economic options for hay production and equipment. Contact the state Extension office in your state to learn more.

- **Colorado State University**, www.coopext.colostate.edu/abm/abmndx.html
- **Iowa State University**, www.extension.iastate.edu/agdm
- **Kansas State University**, www.oznet.ksu.edu/forage/econ.htm or www.agmanager.info/crops/budgets
- **Ohio State University**, <http://aede.ag.ohiostate.edu/people/moore.301/crops-2003/index.htm>
- **Oklahoma State University**, www.agecon.okstate.edu/budgets/
- **Oregon State University**, http://oregonstate.edu/dept/EconInfo/ent_budget/
- **University of Missouri**, <http://agebb.missouri.edu/mgt/budget>
- **University of Tennessee**, <http://economics.ag.utk.edu/budgets>
- **Virginia Tech**, www.ext.vt.edu/departments/agecon/spreadsheets/crops

Also, visit the following sites to view markets nationwide for those wishing to purchase or sell hay: www.hayexchange.com/hay.htm; www.fsa.usda.gov/haynet/; and www.angusjournal.com/drought.

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number of cows out there. So your costs are going to go up, too, and you're probably going to have to go out in the open market and purchase hay or some other feedstuff out there anyway to compensate for the loss," he explains.

Both Moore and Wells say despite market fluctuations, the costs of

purchasing hay supplies should even out in the long term. "The years that they have to go out and buy it at a high price will be offset by the years that they are able to buy it locally and buy it cheaper than what it would cost to produce it themselves," Moore adds.

Cattlemen in areas of recurring

drought, though, may not see relief from high prices. "It all depends on where you're located," Snodgrass maintains. "In this area, we don't usually have a lot of widespread drought. If you take the Western states, though, where they've had long periods of drought, it may be a completely different consideration for those folks, based on availability and what price they can get."

Hay quality is also a concern for many producers wary of purchasing the feedstuff. "I know exactly what I'm getting when we roll in with that baler," Nikkel says. "There aren't any quality guarantees if you're buying it, unless it's been tested or you're buying from a trusted source."

Moore recommends getting hay samples tested to determine proper quality before purchase. Producers should also match hay quality to livestock needs, he says, with high-quality hay reserved for animals with higher energy requirements.

"Hay is a mainstay of our cattle operations. It's an important part of meeting a herd's nutritional needs," Moore says. "People just tend to compare the cash costs of producing hay to the cash costs of buying hay. It looks way more expensive to buy it when you're only looking at out-of-pocket outlay, but purchasing hay is more competitive costwise than you think."

Economics applied

Although calculating budgets such as those suggested by Moore and Wells can seem slightly overwhelming at first, Snodgrass reassures others that a few hours of paperwork are well worth the effort.

"People shy away from buying their hay because it can be a big cash outlay, but once I saw those direct costs of putting it up ourselves, actually writing the check wasn't as big a deal," he says. "Those are expenses that you accrue one way or the other, whether you write that check for a bale, write that check for fuel or write the check for labor."

If nothing else, Snodgrass says, reassessing production strategies allows producers to look at the big picture — to cut overall feeding costs. Whether a cattleman decides to produce or purchase his or her hay supply, he notes, it's important to consider additional options like feeding less hay, considering custom work, stockpiling pastures for winter grazing or feeding cheaper commodities.

"There are other things that people may do to help make producing hay justifiable," Moore adds. "Maybe a large farming operation would have some of this equipment where they could spread costs out, but apply costs to just your cattle operation, and you could really see some savings in purchasing hay."

While that option may not currently be favorable for Nikkel, he says he'd have a hard time turning it down if he could buy hay cheaper than producing it himself.

"It will probably always be a part of ranching for us," he says. "But if I could buy it cheaper, I would give it up."

For Snodgrass, the venture has been a profitable one.

"I'm sure buying hay would not be for everybody, just from the standpoint I mentioned earlier," he says. "As for me, well, I don't miss [baling] it."