►**Left:** Clemson researchers John Andrae and Susan Duckett have been able to get 80% of their research cattle into the Choice grade with time in the feedlot after weaning, then right before harvest. The rest of the time they are on pasture.

Timing is Everything

Clemson researchers hit 73% Choice with a short stint in the feedlot.

*by **Becky Mills,** field editor*

Whether you're trying to finish steers for a beef business or make sure your yearling bulls shine come ultrasound time, Clemson researchers Susan Duckett and John Andrae have good news. Duckett, an animal scientist, and Andrae, a forage specialist, found they could put steers on a concentrate ration for less than four months after weaning, then move them to pasture for the rest of the finishing phase and still average 73% Choice.

Even better, the husband-and-wife team bumped that up to 80% Choice by adding another short feedlot session at the end of the finishing phase.

"In the Southeast, grain is high-priced," says Duckett. "We wanted to look at how to reduce the time in the feedlot but still have high-quality beef."

The trials

Duckett and Andrae started the trial in November with 40 Angus-cross steers that had been preconditioned for 30 days after weaning. They divided the group in half. For Phase 1, 20 steers went in the feedlot and were gradually introduced to a concentrate ration of 85% corn and 15% corn or small-grain silage.

The other 20 steers went on pastures of novel endophyte tall fescue and/or winter annuals. Both groups stayed put for 111 days, then all 40 went to pasture the third week of February for Phase 2.

"We used the best forage we had," says Andrae. For 98 days the whole group was on pasture that was straight alfalfa, nontoxic tall fescue or oats. One steer died of causes unrelated to the treatment.

For Phase 3, once again the group was divided into the original Phase 1 feedlot and pasture groups, then each group was divided into two more groups to form groups of 10, 10, 9 and 10.

One group of 10 steers that spent Phase 1

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Good news from the Omega front

You've probably heard all the talk about the advantages to human health from the low ratios of Omega-6 to Omega-3 fatty acids in forage-finished beef. Clemson animal scientist Susan Duckett says the finishing study she and fellow researcher/husband John Andrae conducted confirms it.

"Health officials recommend an omega-6 to omega-3 ratio of under 4:1," says Duckett. "All the cattle in our study ended up under that."

The best (lowest) ratio, 1.4:1, was from the cattle that spent the entire finishing phase on pasture. The highest was in the cattle who started and ended their finishing phase on a concentrate ration, but that group's ratio still was only 3.1:1.

"Since all the cattle spent some time on pasture, their ratios were not as high as what we observe in cattle finished entirely on grain," says Duckett. "If they are weaned and put straight in the feedlot and stay in the feedlot, their omega-6 to omega-3 ratios are probably going to be around 6:1. Their ratios change in the wrong direction the longer they stay in the feedlot."

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in the feedlot spent Phase 3 in the feedlot for a total 77 days until they reached finished weights averaging 1,250 pounds (lb.). The other group of 10 remained on pasture for 133 days to the same weight end point.

The steers that were on pasture in Phase 1 were divided into two groups of 10 and 9, with one group going to the feedlot for 91 days and one group going to pasture for 133 days. Both of these groups were also harvested at the 1,250-lb. end point.

To make sure the pasture phases were top quality, even in summer, Andrae added warm-season annuals like brown mid-rib Sudan grass and cowpeas.

"We got the highest amount of marbling, the highest percent grading Choice, by putting the calves in the feedlot right after weaning, then either back in the feedlot or on pasture at the end," says Duckett. "Even when we put the cattle that were in the feedlot in Phase 1 on pasture in Phase 3, they still had more marbling than the cattle that weren't in the feedlot in Phase 1."

The cattle that were on pasture for the entire study graded 20% Choice. If they were in the feedlot for a short time right before harvest, they averaged 44% Choice. The cattle that were in the feedlot for Phase 1 and on pasture for Phase 3 averaged 70% Choice,

►Clemson forage specialist John Andrae says forage needs to be high-quality to keep cattle gaining during the finishing phase.

►Clemson researchers got 70% of their cattle to the Choice grade by putting them in the feedlot right after weaning, then finishing them on forage.

Table 1: Clemson study comparing timing of feedlot finishing vs. pasture finishing

Phase 1:	Feedlot (F)		Pasture (P)	
Phase 3:	F	P	F	P
No. steers:	10	10	9	10
Days to 1,250-lb. target wt.[#]	286[i]	342[f]	300[g]	342[f]
Live weight, lb.	1,265	1,236	1,278	1,225
Hot carcass weight, lb[+]	717[d]	670[e]	711[d]	653[e]
Overall ADG, lb./d[+]	2.42[d]	1.82[e]	2.38[d]	1.78[e]
Fat thickness, in[+]	0.43[d]	0.35[e]	0.52[d]	0.32[e]
Ribeye area, sq. in.[#]	12.77[f]	11.12[g]	11.89[f,g]	11.75[g]
Marbling score[*]	580[a]	531[a]	508[b]	472[b]
% Choice	80%	70%	44%	20%
Yield grade[#]	2.65	2.76	3.17	2.34

[*]Phase 1 ($P < 0.05$); [a,b,c]Means in same row with uncommon superscripts differ.

[+]Phase 3 ($P < 0.05$); [d,e]Means in same row with uncommon superscripts differ.

[#]Phase 1× Phase 3 Interaction ($P < 0.05$); [f,g,h,i]Means in same row with uncommon superscripts differ.

while the cattle that were in the feedlot for Phase 1 and Phase 3 hit 80% Choice.

While the good news is cattle can grade Choice on limited amounts of concentrate, Andrae stresses that the pasture phases of finishing need to be on high-quality forages.

"Keeping adequate amounts of high-quality forage available is simple on paper but harder in real life," he explains. "We grazed alfalfas in pure stands, cowpeas, nontoxic tall fescue and summer annuals like brown mid-rib Sudan grass and cowpeas."

He adds, "Novel or endophyte-free tall fescues are a great option for long term. They are a perennial and high quality when well-managed. So are orchard grass and smooth brome grass, and Kentucky bluegrass, depending on your location."

However, he says, "With endophyte-infested Kentucky 31 fescue or Bermuda grass or Bahia grass, it would be a challenge to get adequate gains without supplementing them."

Duckett says the study worked out particularly well in their part of the country. She explains, "We put the cattle on feed right away, from November through February, when we may be short on forage anyway.

►Clemson animal scientist Susan Duckett says cattle need to gain at least 1.5 lb. a day during the finishing phase.

Then, as soon as the grass greened up, we put them on forage."

"The study shows that you can incorporate more forage than we thought in the finishing period," she concludes.

Andrae adds, "As long as that forage is good quality."

Editor's Note: *Becky Mills is a freelancer and cattlewoman from Cuthbert, Ga.*

Selling grass-finished freezer beef

Grass-finished beef is in high demand. Many farmers are selling grass-fed beef as freezer beef. Grass-finished freezer beef will typically have a lower dressing percentage than grain-finished beef. Producers should consider that and other factors when setting a price.

In a group of 54 cattle finished on grass through Michigan State University (MSU) Extension research, there was an average live weight of 1,224 pounds (lb.) with carcass weights averaging 668 lb. This equates to an average dressing percentage of 55%. Typically, grass-finished beef will range in dressing percentage from 53% to 58%, depending mainly on the amount of fat cover, muscling and carcass size.

The leanness of grass-finished beef may attract some customers, but it is still advantageous to aim for 0.3-0.4 inches (in.) of backfat opposite the 12th rib. This will allow for a carcass that has enough cover to stay in the cooler for 14 days of aging without drying out too much. It will also allow for enough fat for the ground beef. Depending on the genetics, type and size of the animal, decent marbling can be achieved in grass-finished beef if enough high-quality forages are available.

The Grass-Finished Freezer Beef Pricing Worksheet on the MSU Extension Beef Team website takes into account the lower dressing percentage and goes step-by-step through calculations to determine the live-weight price comparison and average final packaged price. The worksheet gives current averages as of August 2013, but producers are encouraged to determine their own production costs and marketing margin before setting a carcass price.

Using the average of four grass-finished beef carcass prices obtained recently from different meat processors, the average carcass price (typically hot carcass weight but sometimes cold carcass weight is used) for grass-finished beef is $2.88. On a 1,200-lb. steer that has a dressing percentage of 55%, that equates to $1.58 per lb. on a live-weight basis. Current wholesale grass-finished beef is worth $2.50 per lb. on a carcass-weight basis or $1.375 on a live-weight basis. Current grain-finished cattle are bringing $1.25 to $1.30 per lb. on a live-weight basis.

Using the $2.88 per lb. carcass-weight price and a 70% yield of the carcass weight makes the final packaged price around $4.88 per lb. The average retail price of all Choice beef cuts in July 2013 was $5.35. Additional value can often be captured if individual cuts of grass-finished beef or smaller bundles of beef are sold.

— by Jeannine Schweihofer, Michigan State University Extension