Risk Efficient Strategies for Using Winter Wheat Pasture

Karen W. Taylor, Francis M. Epplin, and Derrell S. Peel

Karen W. Taylor is a research assistant, Francis M. Epplin is a professor, and Derrell S. Peel is a professor, Department of Agricultural Economics, Oklahoma State University, Stillwater.
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Contact author:
Francis M. Epplin
Department of Agricultural Economics
Oklahoma State University
Stillwater, OK 74078-6026

Phone: 405-744-6156
FAX: 405-744-8210
E-mail: epplin@okstate.edu

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Abstract

Two objectives were pursued. The first was to determine the expected value of two monensin supplementation strategies for steers and heifers pastured on fall-winter wheat with alternative beginning weights. The second was to determine the expected value of extending the fall-winter wheat pasture grazing season by one or two weeks.

Keywords: wheat pasture, stockers, risk, monensin

Introduction

Lush fall and winter pastures produced by dual-purpose winter wheat offer a valuable source of forage for beef cattle. Pasturing young steers and heifers on dual-purpose winter wheat is a major agricultural activity in the Southern Plains of the United States. Two-thirds of the winter wheat planted in the region is intended to produce both fall-winter forage for grazing and grain (True et al.). In a dual-purpose wheat forage plus grain system, wheat is planted in early September and is available for grazing by livestock from late November until development of the first hollow stem, usually in late February or early March. First hollow stem is the stage when the stems begin to elongate or hollow stem begins forming just above the roots. If the livestock are removed prior to development of first hollow stem, the wheat will mature and produce a grain crop for harvest in June.

Research has found that grazing past the first hollow stem growth stage substantially decreases grain yield (Redmond et al.). The occurrence of first hollow stem depends on several factors including climate, weather, precipitation, and variety. Usually, the fall-winter wheat grazing season extends from mid-November to late February or early March. These winter wheat pastures are stocked with young steers or heifers that are purchased in the fall and sold at the end of the winter grazing season in late February or early March. If the general trend in prices is increasing, the activity can be quite profitable. However, if the general trend in prices is decreasing; that is, if cattle prices decline during the relatively brief period of ownership, the activity can incur substantial losses. Therefore, there is a substantial amount of variability in expected returns.

Several factors have motivated this study to determine differences in expected wheat stocker net returns across sex, beginning weight, monensin feeding strategy, and sale date. For the past 14 years the USDA has been reporting Oklahoma City steer and heifer prices in 50-pound increments. The late February-early March price patterns across weights show that the value of weight gain is very sensitive to weight. For example, for a 650 pound animal the historical value of gain during the first two weeks of March has been $0.49 per pound. However, for a 700 pound animal the value has been $0.35 per pound, and for a 750 pound animal the value has been only $0.23 per pound. These price patterns suggest that the profitability of wheat pasture stockers may depend critically upon the weight of animals purchased in the fall, rate of gain, and the February-March date of sale.

A related factor is that while the weight gain benefits of feeding ionophores have been documented, less than half the producers (39%) feed ionophore providing supplements to wheat pasture stockers (Hossain et al.). An ionophore is an organic compound that facilitates the transport of ions across the cell membrane. Monensin is a polyether ionophore antibiotic, which is produced by fermentation of *Streptomyces cinnamonensis*. In ruminants with developed forestomachs, monensin increases the rate of weight gain and enhances feed efficiency. Given the price patterns, the marginal value of monesin induced weight gain may be minimal and may differ depending upon initial weight and sex. However, this remains to be determined.

A related factor is that part of the winter wheat breeding program in the Southern Plains has been directed to develop dual-purpose varieties. A recently released variety will provide an additional week of pre first hollow stem grazing. The value of this extra week of grazing may depend critically upon the stocker price patterns. A dual-purpose variety may be required to sacrifice grain yield for either enhanced forage yield or an extended grazing season. Estimates of the value of an additional week of grazing during the critical late February-early March period could be used to provide guidance to the wheat variety development program.

Objectives

This study has two objectives. The first specific objective is to determine the expected value of two monensin supplementation strategies for steers and heifers pastured on fall-winter wheat pasture with alternative beginning weights. The second specific objective is to determine the expected value of extending the fall-winter wheat pasture grazing season by either one or two weeks.

Risk is important in agricultural production. Producers are faced with business decisions that will affect their returns. Several studies of dual-purpose winter wheat and stocker production have been conducted (Epplin et al.; Horn et al.; Hossain et al.; Kaitibie et al.; Rodriguez et al.). Because of the Southern Plains' competitive advantage that comes from the ability to graze cattle on wheat through the winter months when other areas are unable to do so, stocker production has become very important to the regional agricultural economy. Research in this area is appropriate to better understand the industry and to keep the industry thriving.

Previous studies have provided some results in an attempt to assist producers in maximizing economic returns. Peel describes different beef growing and backgrounding programs. Hossain et al. identified the wheat production and management practices used by Oklahoma grain and livestock producers. Katibie et al. (2003a) found the optimal stocking density for dual-purpose winter wheat and stocker production. Redmond et al. showed that dual-purpose wheat grain yield is maximized when grazing is terminated at first hollow stem. Paisley et al. and Horn have evaluated various supplementation strategies for steers on wheat pasture. They found that stocker weights increase when fed monensin. Epplin et al. (2001) determined and compared the historical net returns from grain-only wheat with the historical net returns from dual-purpose wheat. However, limited research has been done comparing net returns of stocker production by using different purchase weights and sex, different supplementation (i.e.. monensin) strategies, and various sell dates.

Procedures

A total of 81 stocker production strategies were defined. This includes nine purchasing strategies (five steer (S) weights (375, 425, 475, 525, and 575 pounds) and four heifer (H) weights (375, 425, 475, and 525 pounds)), three supplementation strategies, and three selling dates. Figure 1 includes a flow chart of the various stocker production strategies. The typical dual-purpose winter wheat stocker grazing season begins in mid-November, after the stocker calves have been through a three week receiving program. During the receiving program the calves are treated with medication and prepared to be placed on wheat pasture. Average daily gain is assumed to be one pound per head per day for a period of 21 days.

Kaitibie et al. (2003b) reported that the average placement date for stocker cattle on wheat pasture over a 12-year period at the Wheat Pasture Research Unit in North Central

Oklahoma was November 12. Using this information, it is assumed that producers purchase the stockers 21 days previous to the placement date. That is, stocker cattle are assumed to be purchased on October 22. Hossain et al. found the Oklahoma state average for beginning weights for pasture steers was 460 lbs and 447 lbs for heifers. The present study considers five different purchase weights for steers and four different purchase weights for heifers.

Daily weight gain of the stockers is an important measure because it affects net returns. Producers try to increase daily gain to increase the overall revenue generated from the sale of their stockers at the end of the season. To increase feed efficiency and gain in stocker systems, additives can be fed, such as monensin. Producers have a choice of whether to feed monensin, as well as which method of feeding. Monensin can be fed as part of a supplement, but it results in increased costs. Not only must the producer purchase the supplement, but they also encounter the increased expense, in terms of labor; that is, physically feeding the monensin to the stockers. This research considers three feeding strategies: no supplement, feeding Oklahoma Green Gold (OKGG), or feeding R-1620.

OKGG is a monensin containing energy supplement designed to be hand fed at a level of four pounds per head every other day to obtain an average intake of two pounds per head per day. Designed experiments have found that the OKGG program increases average gain of steers and heifers on fall-winter wheat pastures by 0.42 pounds per head per day. The cost of OKGG is estimated to be $0.08 per pound. The average feeding rate of two pounds per animal per day results in an expected daily cost of $0.16 per head. This does not include the labor and management cost of feeding the supplement.

R-1620 is a monensin containing energy supplement designed to be free-choice at a desired level of 0.15 pounds per head per day to obtain an average intake of 125 mg per head per day of monensin. Field experiments have found that average gain of animals on fall-winter wheat pasture increases by an average of 0.23 pounds per head per day when supplemented with R-1620. The cost of R-1620 is estimated to be $0.29 per pound. The expected consumption rate is 0.15 pounds per head per day, resulting in a daily cost of $0.04 per head. This does not include the labor cost to feed the supplement.

The actual labor and management cost of the supplement will differ across farms depending upon distance from household to pasture, pasture size, and opportunity cost of labor for individual producers. One purpose of this research is to determine the value of feeding either of the supplements so that producers may weigh this value against the value of their time and cost in addition to the cost of the supplement incurred if they elect to feed. Using this information, individual producers can determine the best strategy for their unique operation.

After the fall-winter grazing season, which usually ends in late February to early March, and at occurrence of first hollow stem, many wheat pasture stockers are sold. The producer has a decision to either sell stockers early at a lighter weight or sell the stockers later at a heavier weight. Peel claims that "strategically, there are three general ways to make money with stocker cattle: value of gain, upgrading cattle quality, and speculation on market trends" (p. 379). Furthermore, he states that the most important factor affecting stocker profitability is the relationship between purchase price and selling price. Ideally, the producer would want to buy the stockers at a low price, have high weight gains, and sell the stockers at a high price to obtain high revenues. However, in an in industry with many participants and competitors, this is difficult to do.

This research considers three different sell dates: February 25, March 4, and March 11. Production data from experiment station trials at Oklahoma State University were used to prepare estimates of expected input requirements and production levels for each of the 81 strategies. A base enterprise budget was constructed for each strategy for each state of nature (or year). Table 1 includes a summary of production assumptions for stocking density, average daily gain, death loss and veterinary medicine expenses for each beginning weight and stocker sex alternative modeled.

The USDA reports steer and heifer prices for the region in 50-pound increments from 1992 to the present. Net returns for each strategy in each year were calculated using:

(1) $NR = [\{P_S \times W_S\}\ \{1 - DL\} - \{P_p \times W_p\} - C] \times [SD]$,

where NR equals net returns per acre ($), P_S represents the selling price ($/cwt), W_S is the selling weight (cwt), DL is the estimated death loss (%), P_p is the purchase price ($/cwt), W_p is the purchase weight (cwt), C represents costs other than the cost of land, labor, and management ($/head), and SD equals the stocking density (head/acre). Stocking density is assumed to be 275 pounds (initial weight) per acre and is adjusted with weight. The stocking density for animals with an initial weight of 375 (575) pounds is 0.73 (0.48) head per acre. In other words, by assumption, 500 acres of winter wheat pasture could provide sufficient forage for 365 375-pound animals, but for only 240 575-pound animals. Selling prices are available in 50-pound increments. To achieve a more accurate selling price for each sell weight, the prices were linearly interpolated.

The various values were used as inputs into the base budget to calculate the net returns generated from each strategy for each year. These data enabled the construction of empirical distributions of net returns that account for price variability from 1992-2005 for each of the 81 strategies. Stochastic efficiency with respect to a function (SERF) was used to compare the strategies (Hardaker et al., 1997). SERF enables the comparison of all alternatives simultaneously. SERF orders a set of risky alternatives in terms of certainty equivalents for a specified range of attitudes to risk (Hardaker et al., 2004). The model is based on the subjective expected utility (SEU) hypothesis. This means that for each risky alternative and utility function, the utility for net income can be calculated, depending on the degree of risk aversion and the distribution of net farm returns. In equation form, the SEU hypothesis is:

$$(2) \qquad U(w) = EU(w) = \int U(w)f(w)dw = \int U(w)dF(w),$$

where U is utility, w represents a wealth variable (i.e. net returns) (Hardaker et al., 2004, p.256). Thus, the SEU hypothesis means that the utility of any risky alternative is equal to its expected value.

SERF can be applied for any utility function for which the inverse function can be computed based on ranges in the absolute, relative, or partial risk aversion coefficient, whichever is appropriate. A negative exponential utility function was assumed:

$$(3) \qquad U(w) = -\exp(-r_a w),$$

where w represents a random wealth variable (i.e. net returns) and r_a is the absolute risk aversion coefficient (ARAC). A negative exponential utility function exhibits constant absolute risk aversion (CARA), which is a reasonable assumption in this study. The exact shape of the utility function is unknown, so the decision maker, in this case, the producer's exact risk aversion is not specified. The problem is solved by finding where the absolute, relative or partial risk aversion function r(w) of the decision maker lies between the lower and upper bounds, denoted by $r_L(w)$ and $r_U(w)$. Furthermore, for convenience, utility may be converted to certainty equivalents (CEs) by taking the inverse of the utility function:

$$(4) \qquad CE(w,r) = U^{-1}(w,r)$$

CEs are more easily interpreted because they are expressed in money terms, unlike utility values. For a risk-averse decision maker, the estimated CE is typically less than the expected money value (EMV). The difference between the EMV and the CE is the risk premium. The general rule for SERF analysis for the given assumptions is that the efficient set contains only those alternatives that have the highest (or equal to highest) CE for some value of risk in the relevant range. The range of risk aversion used in the SERF analysis is crucial. Strategies that are efficient over a certain range of risk aversion levels are determined, so the efficient strategies found are dependent on the risk aversion range they cover. The Pratt-Arrow measure of absolute risk aversion defined as $r(w) = -U''(w)/U'(w)$ is well known. Raskin and Cochran show that scale matters. The appropriate risk aversion coefficient range differs depending upon the level of wealth or income variable. In this study, returns are measured on an acre basis and the risk aversion range is from 0 (risk neutral) to 0.1 (risk averse).

Results

Table 2 includes estimated certainty equivalents for each of the nine sex-beginning weight alternatives for each of the three supplementation strategies. These values were used to determine the additional returns from feeding a monensin supplement (either R-1620 or Oklahoma Green Gold (OKGG)) to wheat pasture stocker steers and heifers. Estimates were computed for both risk neutral and risk averse (RAC of 0.1) situations. Values for the risk neutral situation are reflected in Figure 2. Based upon the assumptions regarding cost of the supplements, the assumed increase in average daily gains, a March 11 sale date, and 1992-2005 market prices, for a risk neutral producer, the value of monensin fed as R-1620 ranges from $2 per head for steers with a beginning weight of 375 pounds to approximately $10 per head for 375, 425, 475, and 525 pound heifers.

As reported in Table 2 and reflected in Figures 2 and 3, for every sex and weight combination the estimated return from feeding monensin as R-1620 exceeds the estimated return from feeding OKGG. The estimated increase in daily gain is greater for OKGG. However, OKGG is more expensive. These estimates may be used to determine if it would be economical for a specific producer to supplement with monensin. For example, OKGG is designed to be hand fed every other day. The March 11 sale date follows from the assumption of 119 days on wheat pasture. A producer who followed the OKGG system would be required to hand feed 59 times during the pasture season. For a 160-acre pasture that was stocked with 525-pound steers at a stocking density of 0.52, the pasture would be fully stocked with 83 steers. The expected additional return from feeding OKGG is $6.47 per head. The expected additional return for the 83 steers is $537. The expected return for each of the feeding trips is $9.10. A 40-acre pasture would be fully stocked with 21 525-pound steers. The expected additional return for the 21 steers is $136 or $2.30 per feeding trip. The values in Table 2 provide information regarding the potential benefits from feeding either of the monensin supplements. However, these benefits must be weighed against the labor costs that are specific to the farm and pasture situation.

Table 3 includes the estimated certainty equivalents and returns from keeping stockers on wheat pasture for both one and two additional weeks after February 25. Estimates are provided for both risk neutral and risk averse (RAC of 0.1) situations. These estimates were computed based upon the cost and gain assumptions associated with the R-1620 strategy.

Figure 4 includes a chart of the additional expected returns from grazing wheat for one and for two weeks after February 25 for a risk neutral producer for each of the nine stocker steer and heifer situations. In general, the value in terms of dollars per acre of one additional week of grazing from February 25 to March 4 is less for steers than for heifers. It ranges from $4.17 per acre for steers with a beginning weight of 575 pounds to $9.44 per acre for heifers with a beginning weight of 375 pounds. Extension of the grazing seasons adds value to the stocker enterprise. However, at some point as the wheat plant develops grazing may reduce grain yield.

Figure 4 also shows the additional expected returns from grazing wheat for two weeks from February 25 to March 11 for a risk neutral producer for each of the nine stocker steer and heifer situations. In general the value in terms of dollars per acre of two additional weeks of grazing after February 25 is less for steers than for heifers, and the second week is not as valuable as the first. For example, for steers with a starting weight of 525 pounds the first week, February 25 to March 4, is worth $4.41 per acre. However, the second week, March 4 to March 11, adds only $3.13 per acre. The reduction of size of the added worth of the second week of grazing is a very likely a function of the seasonal movement in prices as large numbers of stocker cattle move from wheat fields to sale barns.

The results show that for certain risk aversion levels, different strategies are shown to be risk efficient over time. The main conclusions found from this analysis are that lighter stockers that are fed monensin and sold at a later date are most risk efficient. By purchasing lightweight stockers, the producers lower the initial purchase value of the stocker. Furthermore, by feeding monensin, the feed efficiency (i.e. average daily gain) increases; and by selling at the later sell date, the stockers are heavier and results in the producer receiving a higher selling price.

Conclusions

The first specific objective of the study was to determine the expected value of two monensin supplementation strategies for steers and heifers pastured on fall-winter wheat pasture with alternative beginning weights. It was determined that for every sex and weight combination the estimated return from feeding monensin as R-1620 exceeds the estimated return from feeding

OKGG. The expected return from feeding R-1620 ranged from $2.06 per head for steers with a beginning weight of 375 pounds to $10.46 per head for heifers with a beginning weight of 525 pounds. Labor and management cost of feeding R-1620 was not included.

The expected return from feeding OKGG ranged from a negative $1.83 for steers with a beginning weight of 375 pounds to $9.30 for heifers with a beginning weight of 525 pounds. Benefits from feeding OKGG must be weighed against the labor costs that are specific to the farm and pasture situation. The expected additional return for alternate day feeding on pastures fully stocked with steers with a beginning weight of 525 pounds was found to be $9.10 per feeding trip for a 160-acre pasture but only $2.30 per feeding trip for a 40-acre pasture.

The second specific objective was to determine the expected value of extending the fall-winter wheat pasture grazing season by either one or two weeks. In general the value in terms of dollars per acre of one additional week of grazing from February 25 to March 4 is less for steers than for heifers. It ranges from $4.17 per acre for steers with a beginning weight of 575 pounds to $9.44 per acre for heifers with a beginning weight of 375 pounds. Extension of the grazing seasons adds value to the stocker enterprise. However, at some point as the wheat plant develops grazing may reduce grain yield.

In general the value in terms of dollars per acre of two additional weeks of grazing after February 25 is less for steers than for heifers, and the second week is not as valuable as the first. For example, for steers with a starting weight of 525 pounds the first week February 25 to March 4 is worth $4.41 per acre. However, the second week, March 4 to March 11 adds only $3.13 per acre. If the additional two weeks of grazing reduced wheat grain yield by three bushels and if the net value of wheat is $3 per bushel, the cost of additional grazing in terms of lost grain value would exceed the benefits.

A major limitation of the study is that steer and heifer historical price data in 50-pound increments are only available for the last 14 years. The empirical distributions from which the findings are derived were constructed from the available data. More data would be preferred.

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Strategy Flowchart

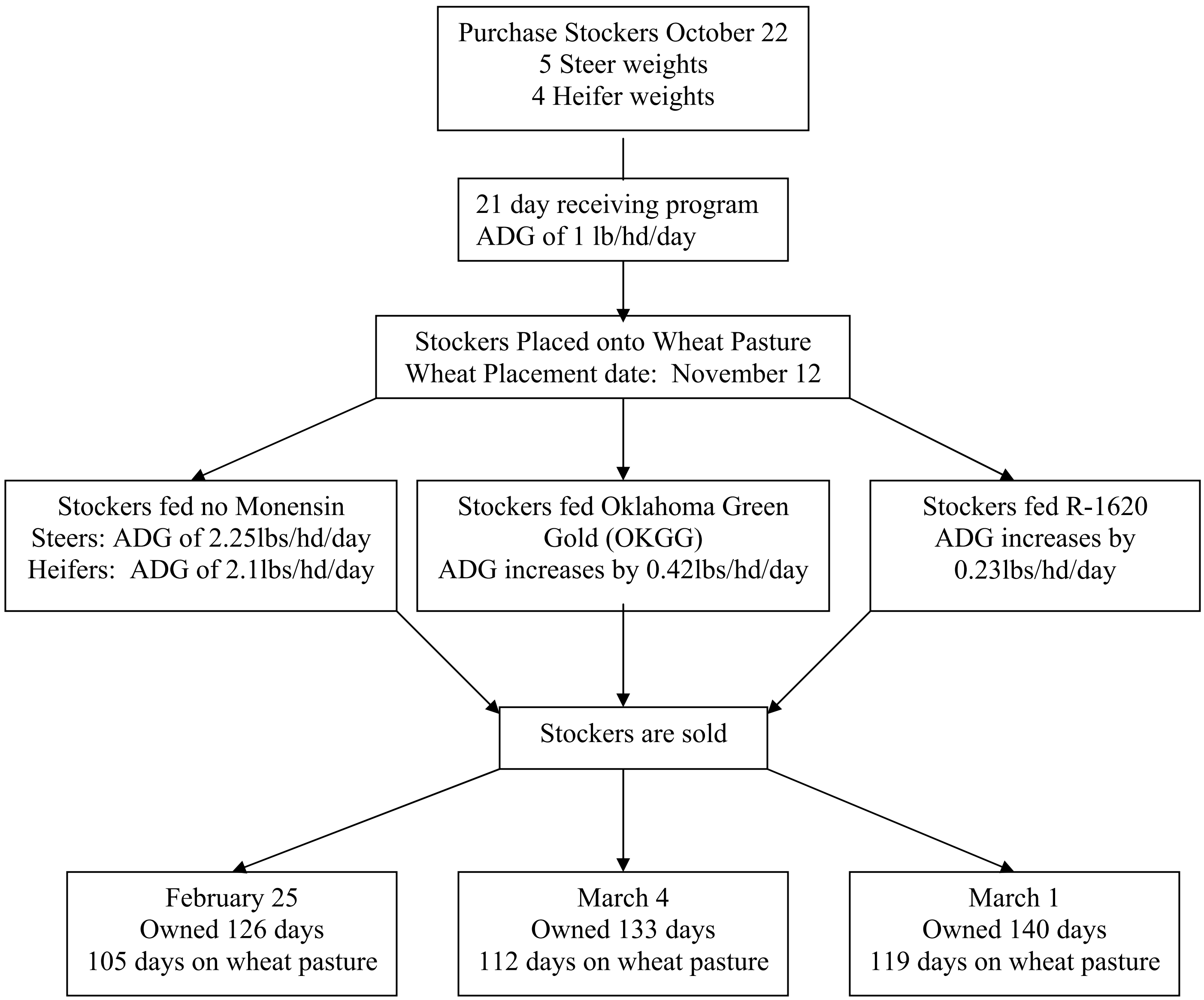

Figure 1: Flow Chart of Stocker Purchase, Supplementation, and Liquidation Strategy Alternatives and Assumptions

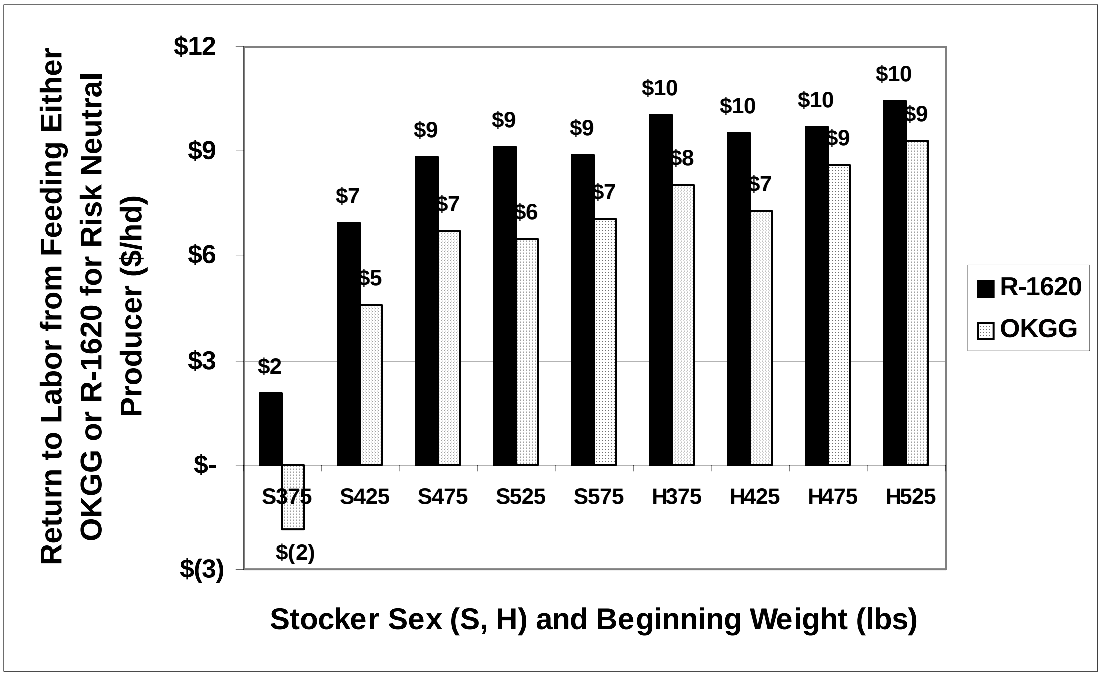

Figure 2. Return to Labor (difference in certainty equivalent) from Feeding a Monensin Supplement (either R-1620 or OKGG) for a Risk Neutral Producer for Steers (S) and Heifers (H) Stocked on Fall-Winter Wheat Pasture with Alternative Beginning Weights ($/hd)

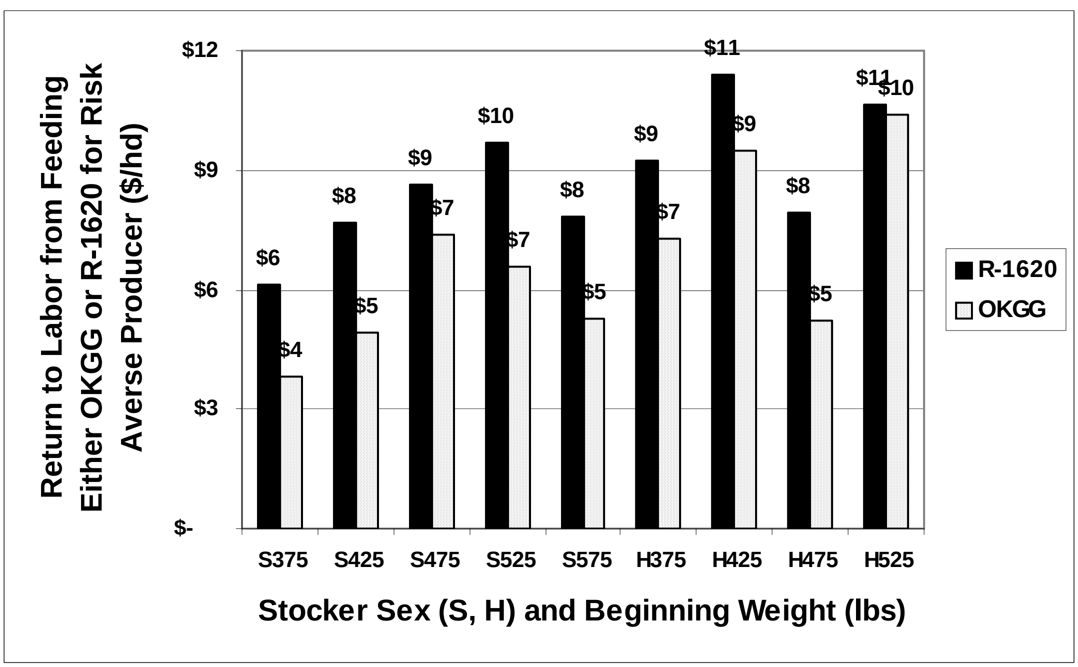

Figure 3. Return to Labor (difference in certainty equivalent) from Feeding a Monensin Supplement (either R-1620 or OKGG) for a Risk Averse Producer for Steers (S) and Heifers (H) Stocked on Fall-Winter Wheat Pasture with Alternative Beginning Weights ($/hd)

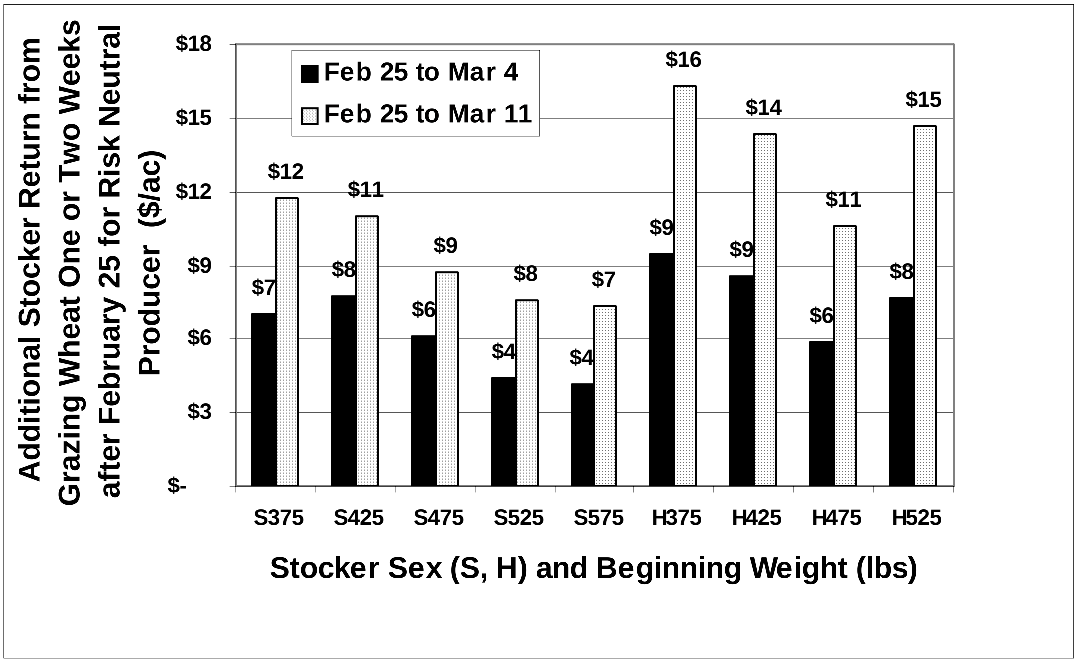

Figure 4. Additional Return from Grazing Wheat for One and for Two Weeks after February 25 for a Risk Neutral Producer for Stocker Steers (S) and Heifers (H) with Alternative Beginning Weights ($/ac)

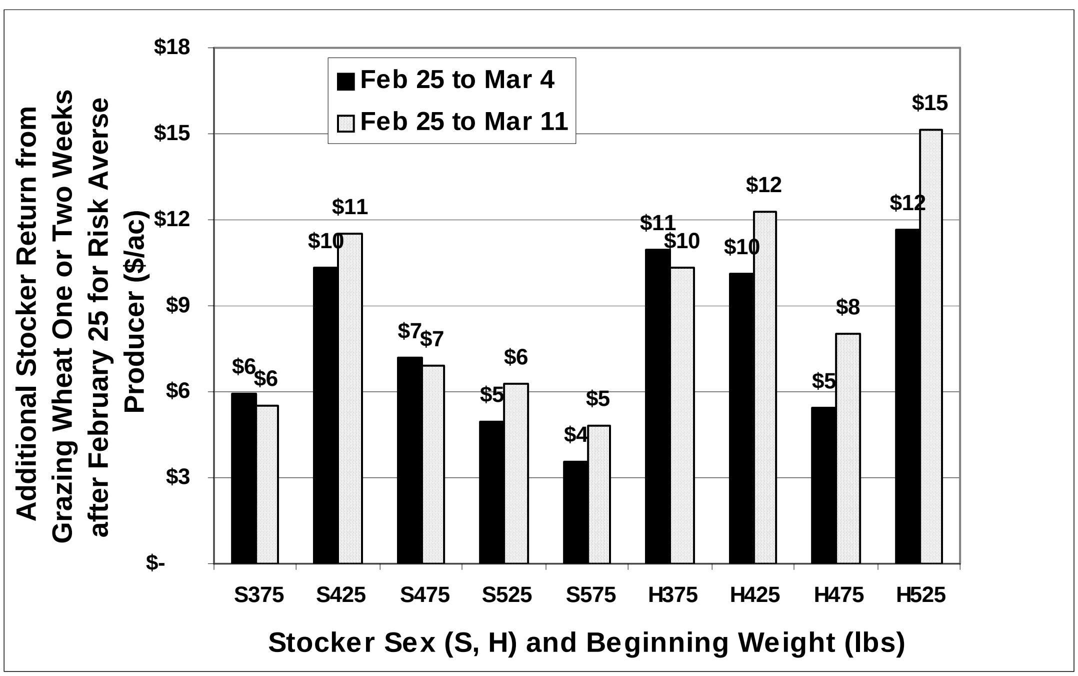

Figure 5. Additional Return from Grazing Wheat One or Two Weeks after February 25 for Risk Averse Producer for Stocker Steers (S) and Heifers (H) with Alternative Beginning Weights ($/ac)

Table 1. Production Assumptions for Stocking Density, Average Daily Gain, Death Loss and Veterinary Medicine Expenses for each Beginning Weight and Stocker Sex Alternative Modeled.

Stocker Sex and Beginning Weight (lbs)	Stocking Density (hd/ac)[a]	Gain with no monensin (lb/day)	Gain with OKGG (lb/day)	Gain with R-1620 (lb/day)	Death Loss (%)	Vet -Med Cost ($/hd)
Steers 375	0.73	2.25	2.67	2.48	2.00	20.0
Steers 425	0.65	2.25	2.67	2.48	1.75	17.5
Steers 475	0.58	2.25	2.67	2.48	1.50	15.0
Steers 525	0.52	2.25	2.67	2.48	1.25	12.5
Steers 575	0.48	2.25	2.67	2.48	1.00	10.0
Heifers 375	0.73	2.10	2.52	2.33	2.00	24.0
Heifers 425	0.65	2.10	2.52	2.33	1.75	21.5
Heifers 475	0.58	2.10	2.52	2.33	1.50	19.0
Heifers 525	0.52	2.10	2.52	2.33	1.25	16.5

[a] Stocking density is based on one 550 pound animal per two acres (275 pounds per acre).

Table 2. Estimated Certainty Equivalents and Returns to Labor from Feeding a Monensin Supplement either with R-1620 or with Oklahoma Green Gold (OKGG) to Stocker Steers and Heifers with Alternative Beginning Weights on Fall-Winter Wheat Pasture for Risk Neutral and Risk Averse Producers (March 11 Selling Date).

Stocker Sex and Beginning Weight (lbs)	Certainty Equivalent No Supplement ($/ac)	Certainty Equivalent Oklahoma R-1620 Supplement ($/ac)	Certainty Equivalent Oklahoma Green Gold (OKGG) Supplement ($/ac)	Return to Labor from R-1620 ($/ac)	Return to Labor from OKGG ($/ac)	Return to Labor from R-1620 ($/hd)	Return to Labor from OKGG ($/hd)
	Risk Neutral						
Steers 375	63.89	65.40	62.55	1.51	(1.34)	2.06	(1.83)
Steers 425	44.68	49.18	47.63	4.50	2.95	6.95	4.56
Steers 475	41.09	46.21	44.99	5.12	3.90	8.84	6.74
Steers 525	38.81	43.58	42.20	4.77	3.39	9.11	6.47
Steers 575	35.96	40.22	39.34	4.26	3.38	8.91	7.07
Heifers 375	62.83	70.18	68.72	7.35	5.89	10.02	8.03
Heifers 425	53.96	60.12	58.69	6.16	4.73	9.52	7.31
Heifers 475	47.00	52.60	52.00	5.60	5.00	9.67	8.64
Heifers 525[a]	39.48	44.96	44.35	5.48	4.87	10.46	9.30
	Risk Averse						
Steers 375	39.90	44.38	42.68	4.48	2.78	6.11	3.79
Steers 425	28.53	33.50	31.70	4.97	3.17	7.68	4.90
Steers 475	26.82	31.83	31.10	5.01	4.28	8.65	7.39
Steers 525	26.21	31.29	29.66	5.08	3.45	9.70	6.59
Steers 575	25.49	29.24	28.02	3.75	2.53	7.84	5.29
Heifers 375	32.77	39.56	38.11	6.79	5.34	9.26	7.28
Heifers 425	36.62	44.00	42.75	7.38	6.13	11.41	9.47
Heifers 475	34.86	39.46	37.89	4.60	3.03	7.95	5.23
Heifers 525[a]	32.94	38.52	38.38	5.58	5.44	10.65	10.39

[a] Prices for heifers with a purchase weight of 525 pounds were only available for 2000-2005. All other prices are from 1992-2005.

Table 3. Estimated Certainty Equivalents and Returns from Keeping Stockers on Wheat Pasture One or Two Additional Weeks after February 25 for Risk Neutral and Risk Averse Producers (stockers supplemented with R-1620) ($/ac).

Stocker Sex and Beginning Weight (lbs)	Certainty Equivalent from Selling on Feb 25 ($/ac)	Certainty Equivalent from Selling on March 4 ($/ac)	Certainty Equivalent from Selling on March 11 ($/ac)	Return from Grazing one week from Feb 25 to Mar 4 ($/ac)	Return from Grazing two weeks from Feb 25 to Mar 11 ($/ac)
			Risk Neutral		
Steers 375	53.71	60.71	65.40	7.00	11.69
Steers 425	38.20	45.94	49.18	7.74	10.98
Steers 475	37.53	43.66	46.21	6.13	8.68
Steers 525	36.03	40.44	43.58	4.41	7.55
Steers 575	32.92	37.09	40.22	4.17	7.30
Heifers 375	53.89	63.33	70.18	9.44	16.29
Heifers 425	45.82	54.40	60.12	8.58	14.30
Heifers 475	42.00	47.89	52.60	5.89	10.60
Heifers 525 [a]	30.32	38.00	44.96	7.68	14.64
			Risk Averse		
Steers 375	38.84	44.76	44.38	5.92	5.54
Steers 425	22.01	32.34	33.50	10.33	11.49
Steers 475	24.94	32.11	31.83	7.17	6.89
Steers 525	25.03	30.00	31.29	4.97	6.26
Steers 575	24.45	28.01	29.24	3.56	4.79
Heifers 375	29.20	40.17	39.56	10.97	10.36
Heifers 425	31.71	41.85	44.00	10.14	12.29
Heifers 475	31.43	36.84	39.46	5.41	8.03
Heifers 525 [a]	23.40	35.03	38.52	11.63	15.12

[a] Prices for heifers with a purchase weight of 525 pounds were only available for 2000-2005. All other prices are from 1992-2005.