Implant Strategies for Finishing Cattle using **Revalor®** (trenbolone acetate and estradiol), **Finaplix®** (trenbolone) and/or **Ralgro®** (zeranol)

Revalor®, Ralgro® and Finaplix®

Wade Nichols, Ph.D., John Hutcheson, Ph.D., Marshall Streeter, Ph.D., Mark Corrigan, Ph.D., Brandon Nuttelman, Ph.D.

IMPLANT STRATEGIES FOR STEERS AND HEIFERS

The following information is designed to help you determine which implant program(s) work best for your feedyard:

- **Part 1: Steer Implant Strategies**
- **Part 2: Steer Implant / Re-implant Strategies**
- **Part 3: Heifer Implant / Re-implant Strategies**
- **Part 4: Implant Strategies Summary**
- **Part 5: Implant Strategy Selection Criteria**

For more information, be sure to discuss with your consulting nutritionist, consulting veterinarian and/or your Merck Animal Health representative.

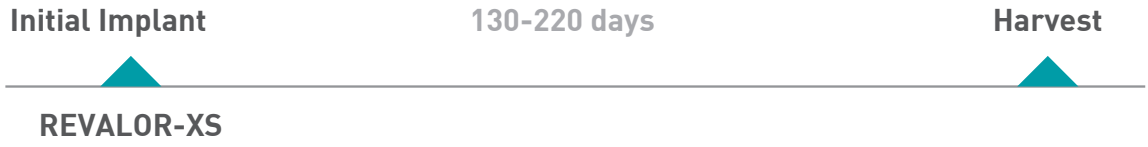
Part 1: Steer Implant Strategies 130-220 Days on Feed

I. THE MOST CONSISTENT ALL-AROUND IMPLANT PROGRAM

Revalor®-XS (trenbolone acetate and estradiol) is the most consistent all-around implant on the market today. Its timed release of active ingredients from the coated pellets on approximately day 70 gives you the absolute best in terms of consistent carcass growth and quality, with exceptional feedyard growth performance. It is absolutely the most consistent, reliable and value-based implant on the market today.

Single-implant Steers to 130 Days on Feed

Single-implant Steers 130-220 Days on Feed



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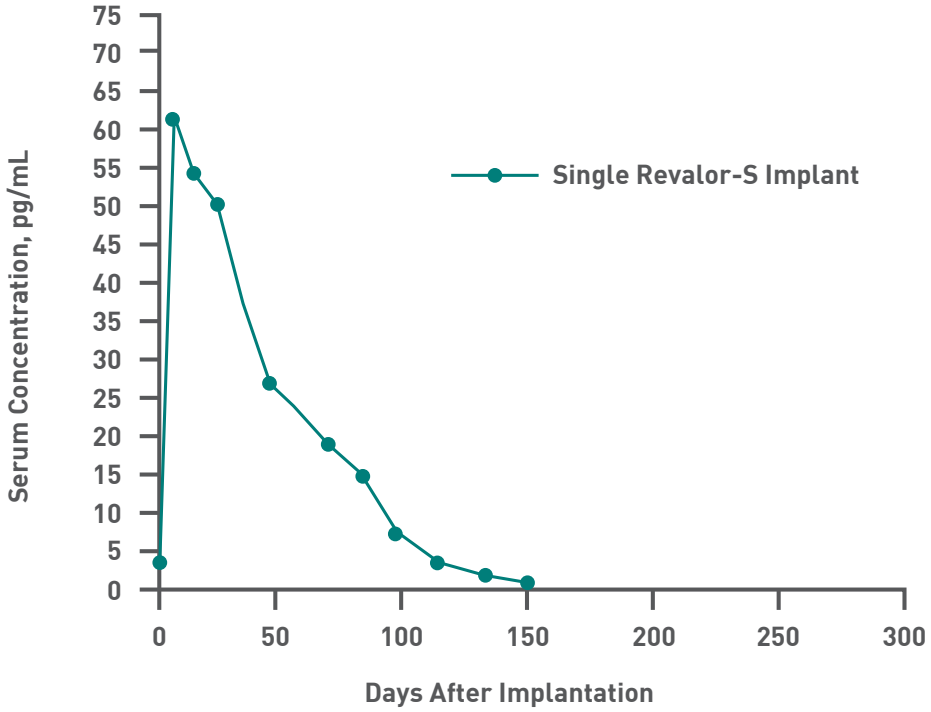
MERCK Animal Health

Payout Data: **Payout characteristics versus non-implanted steers with a single Revalor-S implant.**

Revalor-S Payout



Period Gain Data

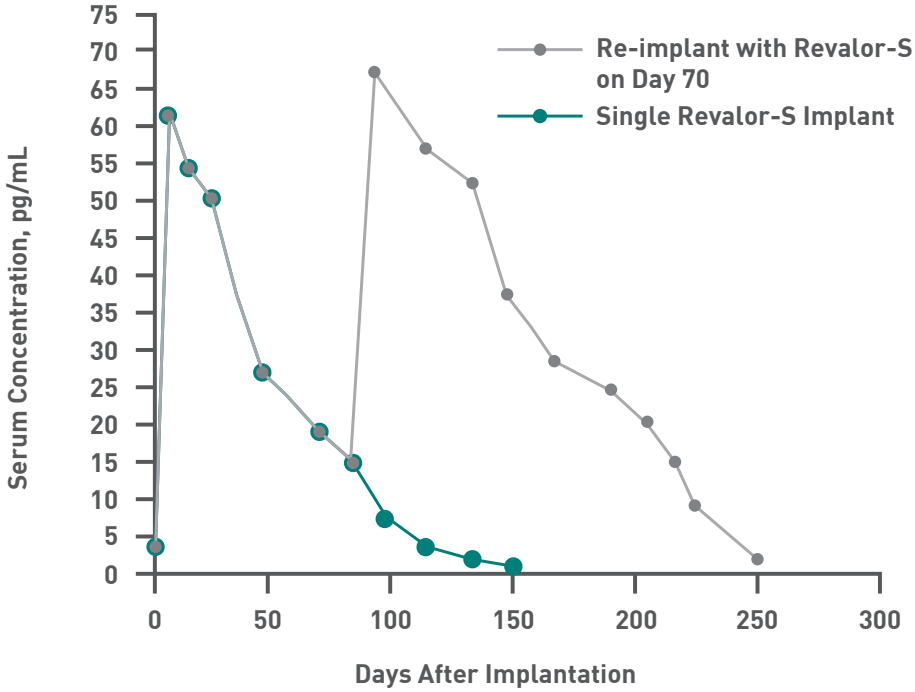
Average Daily Gain (ADG) period response versus non-implanted steers with a single Revalor-S implant.

Period	Daily Gain Response
0-35 days	+28%
35-70 days	+23%
70-105 days	+17%
105-135 days	+10%

Rains, J.R., R.L. Preston, Revalor-S Tech Bulletin 10

Payout Data: **Payout characteristics comparing non-implanted steers with a single Revalor-S or Revalor-S initial with a re-implant on day 70.**

Re-implant with Revalor-S Payout



Period Gain Response

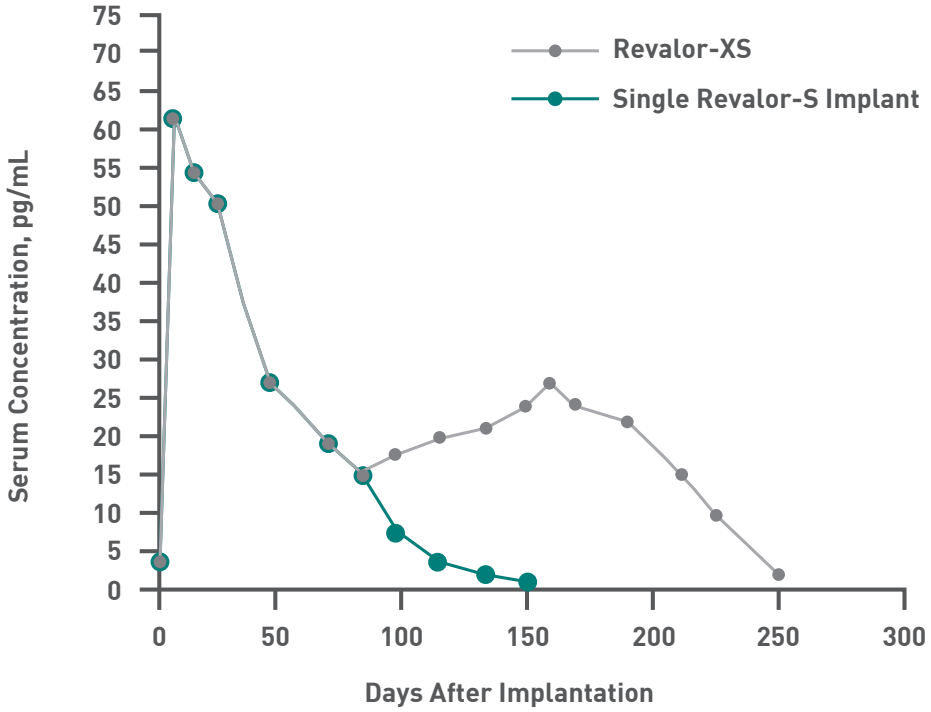
Average Daily Gain (ADG) period response versus non-implanted steers with a single Revalor-S or Revalor-S initial with a re-implant on day 70.

Period	Daily Gain Response
0-35 days	+28%
35-70 days	+23%
70-105 days	+30%
105-135 days	+32%

Rains, J.R., R.L. Preston, Revalor-S Tech Bulletin 10

Payout Data: **Theoretical payout characteristics of non-implanted steers compared with a single Revalor-S or Revalor-XS.**

Revalor-XS Payout



Period Data

Average Daily Gain (ADG) period response versus non-implanted steers compared with Revalor-XS.

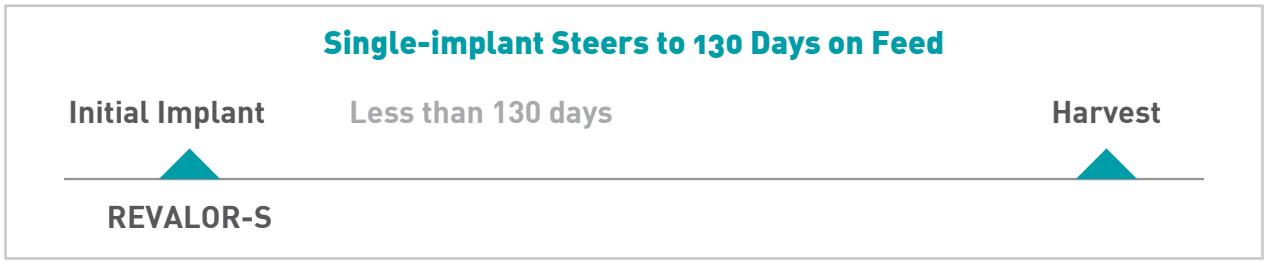
Period	Daily Gain Response
0-35 days	+28%
35-75 days	+18%
75-140 days	+30%
140-177 days	+27%

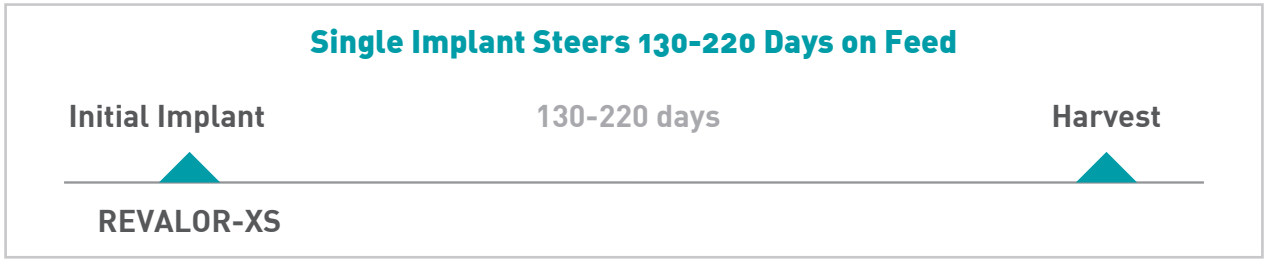
2009 Feedyard Study Data on File

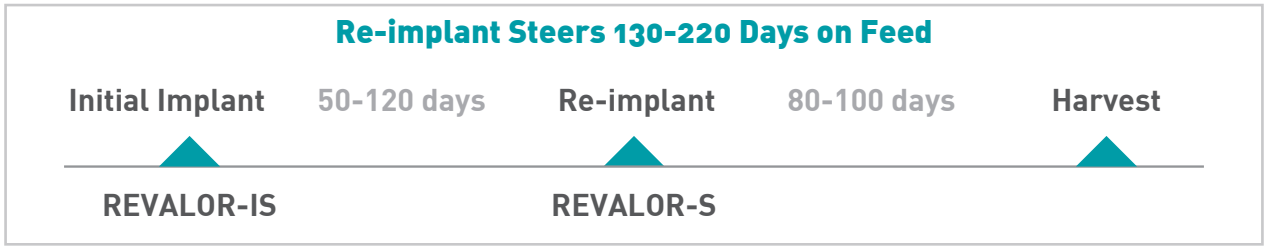
Part 2: Steer Implant / Re-implant Strategies

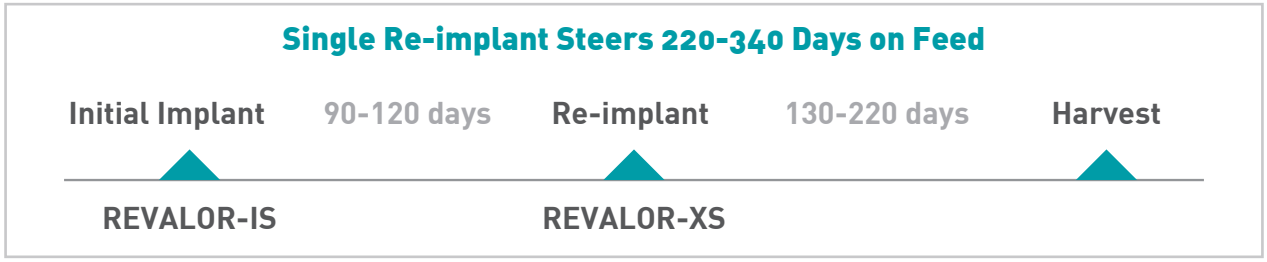
I. ALL-AROUND RE-IMPLANT PROGRAM

Excellent performance in terms of ADG and feed efficiency (F:G). Minimal to no quality grade reduction as long as cattle are finished to their physiological/biological end-points.







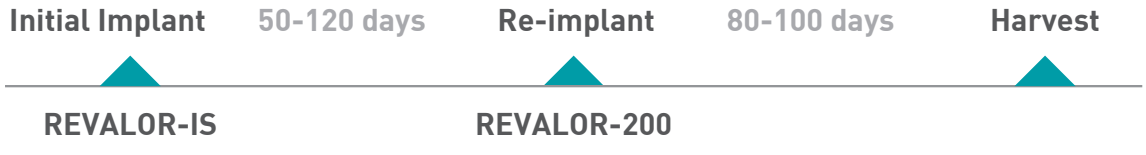


II. SPECIAL-PERFORMANCE-BASED RE-IMPLANT PROGRAM

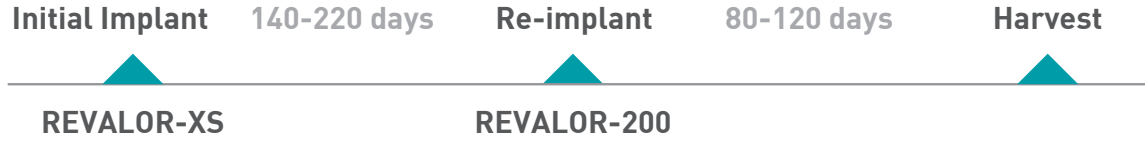
Superior performance in terms of ADG and F:G is the main goal. Heavier weights will need to be achieved to minimize grade reduction.

Single-implant Steers to 130 Days on Feed

Re-implant Steers 130-220 Days on Feed, Performance-Based



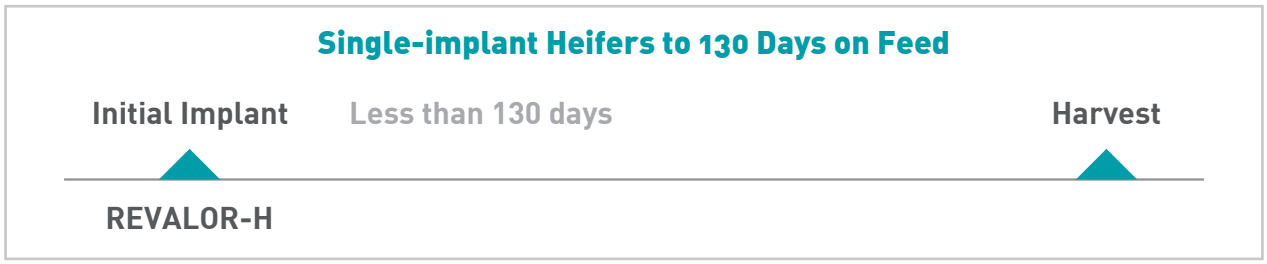
Re-implant Steers 220-340 Days on Feed

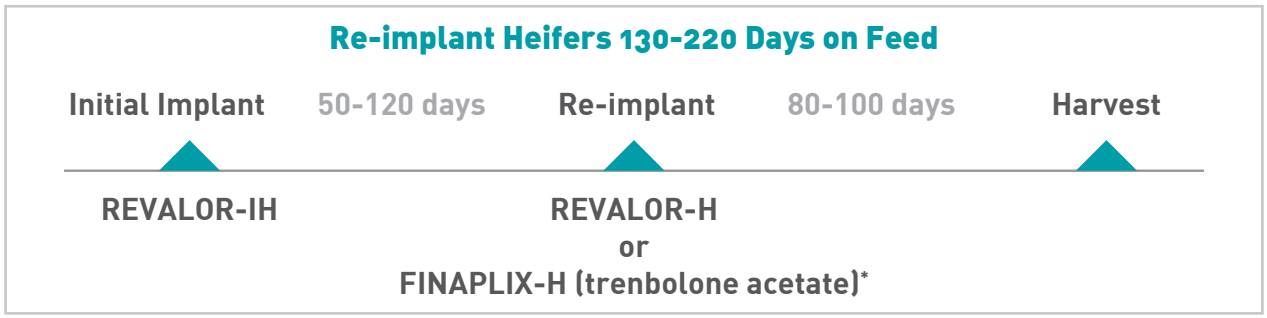


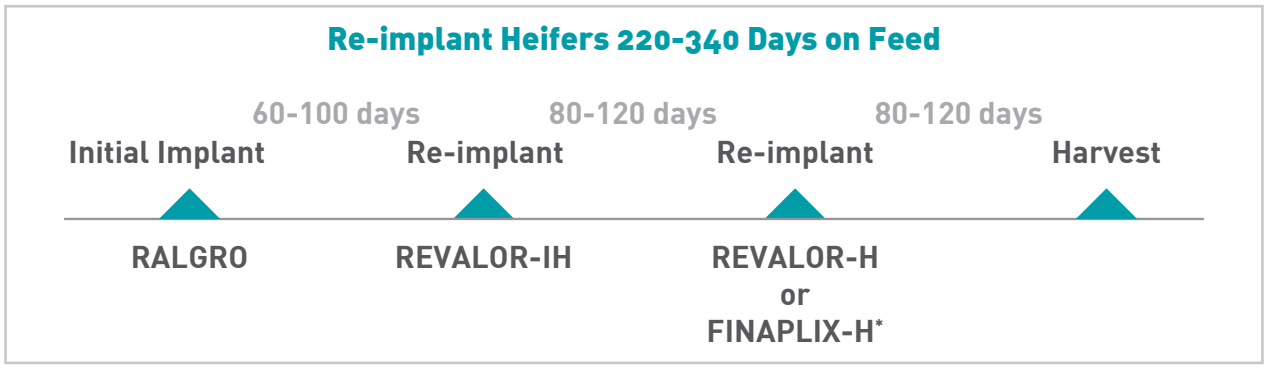
Part 3: Heifer Implant/Re-implant Strategies

I. ALL-AROUND RE-IMPLANT PROGRAM

Excellent performance in terms of ADG and feed efficiency (F:G). Minimal to no quality grade reduction as long as cattle are finished to their physiological/biological end-points.







*Finaplix-H can be used when the terminal implant period is ≤ 100 days.

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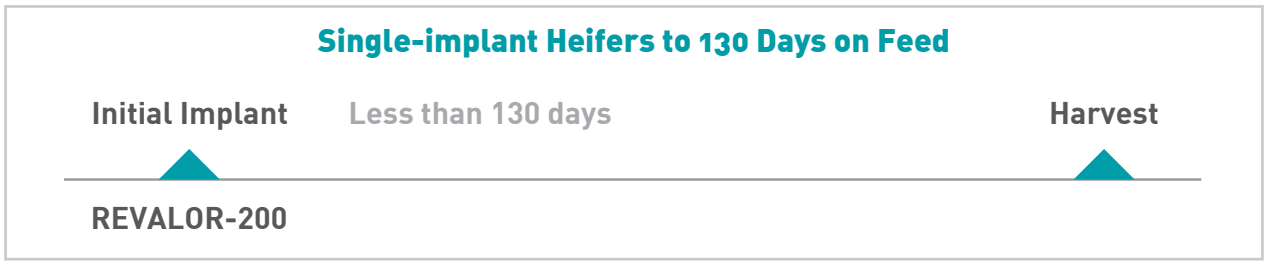
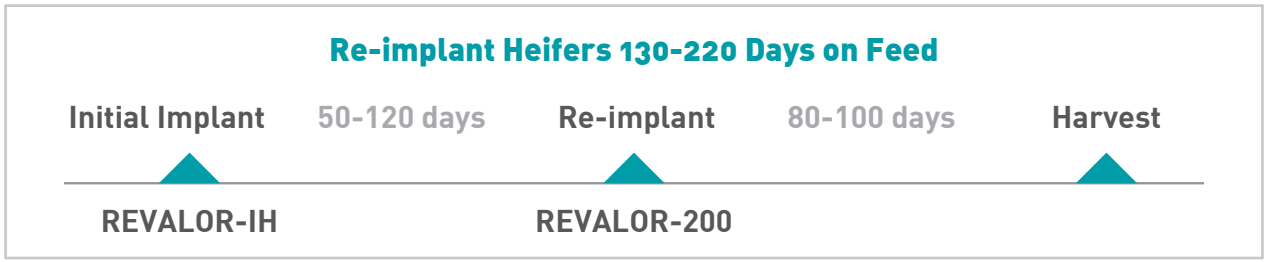
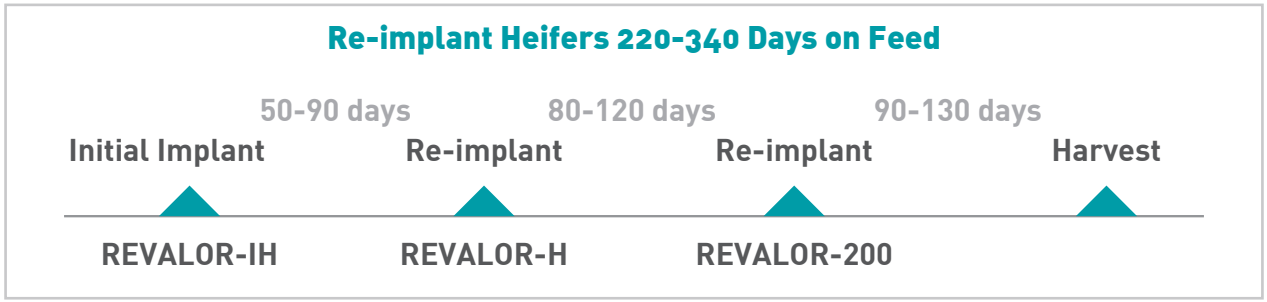
Superior performance in terms of ADG and F:G is the main goal. Heavier weights will need to be achieved to minimize grade reduction.







Part 4: Implant Strategies Summary

Recommended Days on Implant for Steers and Heifers

Implant	Minimum	Ideal Range	Maximum
Revalor-XS	130	130-210	220
Revalor-S	70	80-120	130
Revalor-IS	50	70-90	120
Revalor-H	70	80-120	130
Revalor-IH	50	70-90	120
Revalor-200	70	80-120	140
Finaplix-H	50	60-90	100
Ralgro	30	60-90	100

EXAMPLE: Steer Single Implant Strategies

Days on feed	Initial	Re-implant Day	Terminal
130 or less	Revalor-S	None	None
131-170	Revalor-XS	None	None
171-180	Revalor-XS	None	None
181-190	Revalor-XS	None	None
191-210	Revalor-XS	None	None
211-220	Revalor-XS	None	None

EXAMPLE: Steer All-around Re-implanting Strategies

Steers Re-implant Strategies

Days on feed	Initial	Re-implant Day	Terminal
130 or less	Revalor-S	N/A	N/A
131-150	Revalor-IS	Day 50 →	Revalor-S
151-170	Revalor-IS	Day 70 →	Revalor-S
171-190	Revalor-IS	Day 90 →	Revalor-S
191-200	Revalor-IS	Day 100 →	Revalor-S
201-220	Revalor-IS	Day 120 →	Revalor-S

Days on feed	Initial	Re-implant Day	Terminal Intermediate
221-240	Revalor-IS	Day 90 →	Revalor-XS
241-260	Revalor-IS	Day 110 →	Revalor-XS
261-340	Revalor-IS	Day 120 →	Revalor-XS

EXAMPLE: Heifer Performance-Based Re-Implant Strategies

Days on feed	Initial	Re-implant Day	Terminal*
130 or less	Revalor-200	N/A	N/A
131-140	Revalor-IH	Day 50 →	Revalor-200
141-150	Revalor-IH	Day 60 →	Revalor-200
151-160	Revalor-IH	Day 70 →	Revalor-200
161-170	Revalor-IH	Day 70 →	Revalor-200
171-180	Revalor-IH	Day 80 →	Revalor-200
181-190	Revalor-IH	Day 90 →	Revalor-200
191-210	Revalor-IH	Day 100 →	Revalor-200
211-220	Revalor-IH	Day 120 →	Revalor-200

Days on feed	Initial	Re-implant Day	Intermediate	Re-implant Day	Terminal*
221-240	Revalor-IH	Day 50 →	Revalor-H	Day 130 →	Revalor-200
241-280	Revalor-IH	Day 70 →	Revalor-H	Day 170 →	Revalor-200
281-340	Revalor-IH	Day 90 →	Revalor-H	Day 210 →	Revalor-200

*Finaplix-H can be used when the terminal implant period is ≤ 100 days.

Part 5: Implant Strategy Selection Criteria

All the above implant strategies give you some leeway in marketing cattle. As an example: For those who do not want to re-implant their steers, Revalor-XS provides the greatest marketing flexibility and for those wanting to re-implant a terminal, Revalor-S is mostly utilized 100 days from harvest. This gives you the ability to market cattle earlier than expected and longer than expected, i.e. 170-day cattle can be marketed at 150 or 200 days. There are some trade-offs that we need to be aware of. For example, 150-day cattle will have better ADG and F:G simply because we are selling them somewhat green, the 200-day cattle will have more marbling, maybe higher dressing percentage, more weight, and less ADG and F:G simply because we are selling them over-finished.

During times of low ration costs and fair live cattle prices, we can keep cattle on feed longer and cost of gain rarely exceeds breakeven. We can be performance-based in our feeding and cattle management as well as our implant programs. Conversely, when ration costs become expensive and live cattle prices are low, we will adjust the implant strategies to finish cattle at lighter weights and less time on feed (figure 1).

The spread between choice and select carcasses becomes of interest when the difference in dollars/cwt is substantial. It should also be considered when selling on a grid that pays a premium for marbling. However, finishing cattle to the correct weight will usually negate any marbling differences. As an example, figure 1 depicts ***low feed-low spread***, which would indicate that we would want to feed for average grading and maximum weight. We can use performance-based implant strategy in this economic example. Feeding heavier weights takes advantage of the low feed costs and the heavier weights will help negate any negative marbling effects.

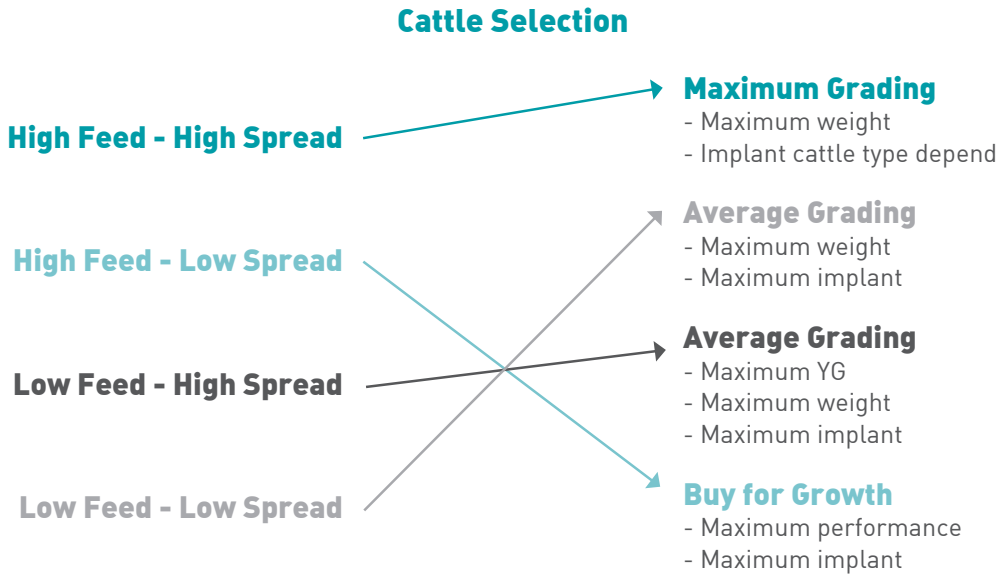
Do not just look at days on feed to determine when cattle are ready for harvest. Let the cattle tell you when they are finished. Look at the cattle's body composition and feed records, since not all 700-weight animals are the same. Adjust days on feed based on animal type, body conformation, and body composition. **In addition, analyze carcass data to see if the cattle are achieving the correct end-points of production.** If the closeouts have virtually all yield grade (YG) 1s and 2s with very little YG 3s and no 4s, then in general, the cattle are too light or green to achieve their genetic potential to marble. The cattle need a percentage of YG 3s to allow them to achieve their genetic potential to marble (on the average), as well as reach a final end weight that allows the cattle to work both from a carcass perspective and a live perspective.

Figure 2 illustrates, as an example, cattle implanted differently and the final end weights needed to achieve an empty body fat (EBF) percentage of 28.6% (Guiroy, et al. 2002, *Journal of Animal Science* 80:1791-1800). Research has indicated that an EBF of 28.6% is required for cattle to reach low choice marbling. Implanting changes the growth curve upward to a higher level. In other words, when we implant cattle that are a frame score 5, we now change their growth to mimic a frame score 6-7 (figure 3). These cattle will now need to be heavier to reach their genetic physiological/biological maturity.

Figure 4 depicts the amount of EBF needed for cattle to grade standard, select, low-choice or mid-choice. On average, if we sell cattle that have less than 28% EBF, they will not exhibit enough finish to reach a USDA quality grade of low-choice. The majority of cattle need to have 28.5-29.5% EBF in order to grade to their genetic potential.

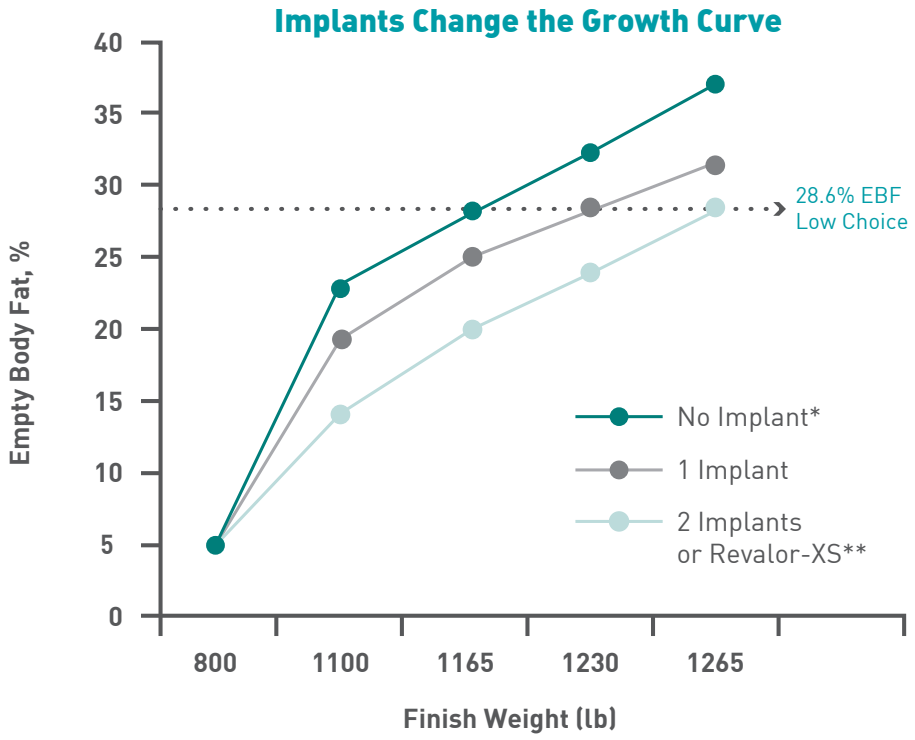
Therefore, all these factors need to be taken into consideration when choosing an effective implant strategy, i.e. feed costs, animal costs, quality grade, genetics, economic advantages of weight (live & carcass), production goals and carcass goals. There are trade-offs to all the above. Implants can help you achieve your goals and benefit you economically in all circumstances.

Figure 1: A grid utilizing feed costs and choice/select spread for implant decisions.



- Adapted from schematic developed by M. Hubbert, Ganado Research, Arroyo Seco, NM
- Feed = Feed costs either high or low
- Spread = Dollars/cwt difference between choice and select carcasses

Figure 2: Growth curve graph depicting finished weights of cattle that are implanted differently.



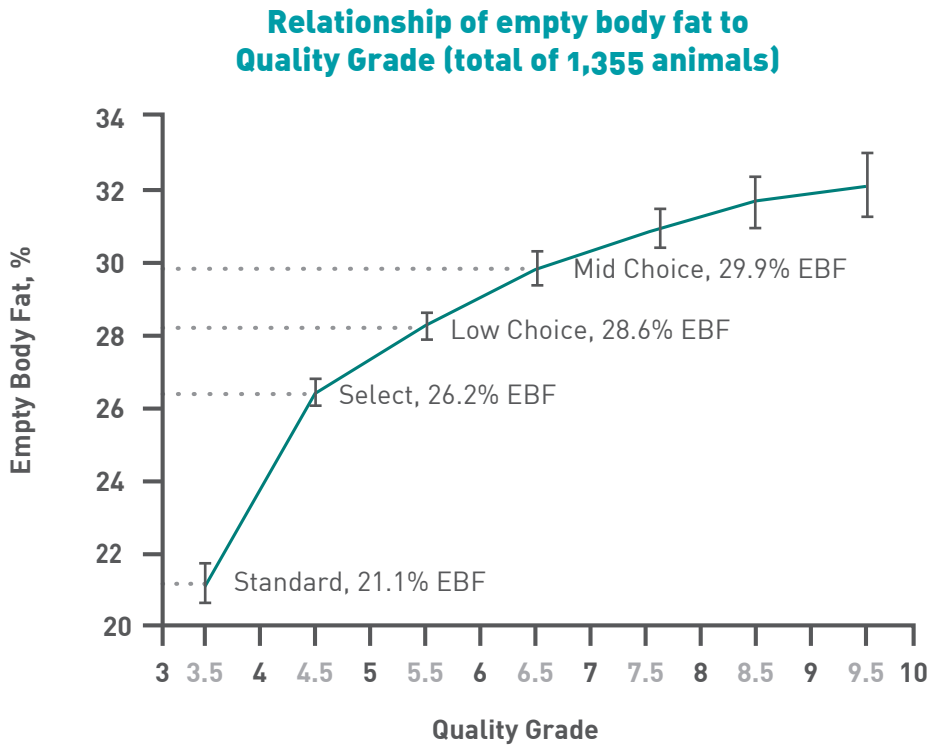
* Based on Guiroy, et al. 2002, *Journal of Animal Science* 80:1791-1800

** Based on Revalor-XS Serial Harvest Study

Figure 3: This table illustrates the finishing weight by frame score relationship for an animal to reach 28% empty body fat.

	Weight (lb) at 28% fat								
Frame size	1	2	3	4	5	6	7	8	9
Steer	882	954	1029	1102	1175	1250	1322	1395	1470
Heifer	705	763	824	882	939	1001	1058	1115	1177

Figure 4. Graph depicting amount of EBF needed to reach a particluar USDA quality grade (Guiroy et al. 2001, *Journal of Animal Science* 79: 1983-1995).



A withdrawal period has not been established for Ralgro, Revalor and Finaplix in pre-ruminating calves. Do not use in calves to be processed for veal. For complete information, refer to product label.

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