Feeding Recommendations

From
Balanced Beef

Balanced nutrition implemented with balance between

Costs and performance
Technology and simplicity
Science and common sense

Protocol Summary

Starting new cattle

Yearlings
Provide hay free choice in receiving pen. Feed straight forage ad libitum until pen is full, or a minimum of 2 days. After feeding forage, start feeding the #1 ration at 2% of body weight. Follow the outlined maximum increases.

Calves
Deliver starter pellets to calves on arrival. Start feeding the C2 ration within 2 days of arrival. Start at 1% of BW (~5 lb of DM). Increase deliveries as needed up to >1.75% of body weight (BW) at which point you should change to C3 ration. Follow max call recommendations beyond this point. Move to ration # 1 when DMI exceeds 2% BW. Minimize use of bedding to encourage eating from the bunk. Only use bedding on new calves in stormy weather.

For all new cattle (< 20 DOF), check bunks at the end of the day to ensure adequate feed.

Ration transition
Ration transition should not start until cattle are settled in the feedlot, intakes have stabilized, and cattle have adequate body size (see Table 1). Introduce the new ration in the afternoon feeding. If making bunk calls on an As Fed basis, Adjust the quantity of the new ration to ensure pounds of dry matter delivered does not increase. For example, if the original ration is 60% DM and the new ration is 65% DM, feed only 60/65 as much of the new ration. Making bunk calls as pounds of dry matter simplifies bunk reading and ration transitions. To maintain consistency and structure in the transition period, consider making ration changes on Mondays and Thursdays.

Table 1. Target finish weights and when to start diet transition

Animal type	**Finish weight, lbs**		**Start diet transition at: lb DMI / animal weight (which ever takes longest)***	
	Steers	Heifers	Steers	Heifers
Yearlings	1450	1300	750 (20 lb)	800 (21)
Intermediates[a]	1400	1250	725 (18 lb)	775 (18)
Calves[b]	1350	1200	675 (16 lb)	725 (17)

*For example, if steer calves have reached 16 lbs of DMI but are not yet 675 lbs, delay transition until weight is 675 lbs. If calves weigh more than 675 lbs but intakes have not reached 16 lbs of DM, wait until intakes have reached 16 lbs. **Alternatively, start transition when animal weight is reached and intakes have been stable for 3 days.**
[a]Intermediates include winter placed calves, moderate framed yearlings
[b]Start weaned calves at 1% of body weight, start all others at 1.5%. Weaned calves should receive starter diet with hay until DMI > 2% BW. Then start transition based on above outline.

Mixing feed
Ingredients should be added in the order of grain, supplement, hay, silage. Mix ingredients as you are driving from the mill to the silage pit. The mixer should also be going as silage is added. Mix for an additional 30 revolutions (about 3 minutes) after all ingredients are added.

Bunk Calls

Minimize crashes in intakes, reduce waste, and achieve and maintain maximum intakes by following a disciplined protocol of feed increases. As intakes climb early in the feeding period, smoothly reach a plateau in intakes by making smaller and fewer increases (Table 2). This will help minimize feed accumulation and waste. Once cattle are settled in the feedlot and maximum intakes (DMI %BW) have been achieved, DMI (lbs) of yearlings will change very little through the remainder of the feeding period. DMI (lbs) of calves will gradually increase.

Table 2. Maximum increases

	< 50 days		**> 50 days**	
	Max increase (lb DM)	**Days between**	**Max increase (lb DM)**	**Days between**
< 1.75	2 lb	0	0.2	1
1.75-2.0	1 lb	0	0.2	1
2.0-2.25	0.5 lb	0	0.2	1
2.25-2.5	0.5 lb	1	0.2	1
2.5-2.75	0.2 lb	1	0.2	1
> 2.75	0.2 lb	2	0.2	1

A slick bunk is not the objective, but it is a frequent result of a good feeding program

Feed delivery

Unless there are only a few animals in the pen, drop off a uniform layer of feed along the whole bunk (including both ends). Deliver the minority of the feed on your first pass so you can get around the feedlot quickly. There are management and performance advantages if the majority of the feed is delivered later in the day.

Cleaning up old feed

With small, disciplined increases in deliveries, feed accumulation should be rare. If feed has accumulated in the bunk and needs to be cleaned out, reduce delivery by the estimated quantity of feed remaining in the bunk (ie 500 lbs). Do this two days in a row if needed. Shovel out the bunk if feed remains on the 3rd day. Once bunks are clean, return to < ½ lb DM of previous max DMI.

Sequencing feed deliveries to reduce cross contamination

When delivering feed that has a withdrawal period (ie tetracyclines), clean out the truck by delivering the subsequent load of feed to cattle that will not be slaughtered within the withdrawal period.

Pit management

Silage losses occur with exposure to air. To minimize waste and spoilage, loose silage should always be used first. However, loose silage should not be used in rations fed to new calves.

Do not randomly take silage from the pit. Expose as little surface area as possible. Each day, you should be taking silage from one small area that is no wider than what is needed for that day.

Pay close attention to details when feeding! Each ingredient is included at a certain level for a reason! Proper feed calls and deliveries help obtain maximum intakes, performance and health through the feeding period.

Introduction

With different cattle types, feeding objectives, ingredients and prices, feedlot managers have many opportunities to improve efficiencies of production. Good cattle feeders capitalize on many of these opportunities. Excellent feeders pay attention to all of them with a focus on those that have the largest impact on performance and cost of gain. Some of the these areas include:

Cattle purchases / sales - pricing, animal quality and condition, selling at proper degree of finish
Diet and delivery - balanced rations with a timely and smooth transition to finishing diets
Grain processing - minimize whole kernels while keeping fines to a manageable level
Implant program - focus on an aggressive implant program late in the finishing period
Commodity purchases - capitalize on opportunity feeds
Pen conditions - proper landscaping, bedding, scraping and cleaning as needed
Health program - vaccination protocols with timely and effective treatment of disease

Capitalizing on opportunities with consistency separates the excellent from good cattle feeders. Following a documented protocol helps achieve that consistency and instills confidence that a plan will be executed properly by all employees. The following guidelines provide protocols for those areas that are key factors in successful cattle feeding. These guidelines are derived from a combination of scientific research, years of experience, tempered with what makes sense biologically.

Ration formula

A series of rations should be available to provide a timely and smooth transition onto a finishing diet. Five rations provide adequate transition (see examples page 13). Fewer rations can be used if rations are blended when new rations are introduced (new diet fed on second feeding). Increased rations are unnecessary and take increased time and complexity for the feed crew. Additional rations may be required for backgrounding cattle at specific gains while capitalizing on low cost ingredients.

An additional starter ration should be used for newly weaned calves. This ration provides an introduction to silage and should help entice calves to the bunk. A high quality, primarily grass hay should be used liberally. Including hay in the starter ration and shredding hay into the bunk for the 1st couple of days helps calves acquire a taste for silage. Hay shredders generate a lot of dust and noise and clearly announce to calves where the feed is. The starter ration should be fed until intakes reach at least 2% of body weight at which point the ration should be changed to #2. Removal of the hay will help slow down intakes providing a safe transition to a higher energy diet.

High grain finishing diets typically result in the best performance and lowest cost of gain. However, feeding these diets too early in life can reduce the weights at which cattle are finished. Making ration changes while intakes are rapidly increasing, or moving cattle onto finishing diets too quick can result in acidosis that can reduce animal performance. **Ration transition should not start until cattle are settled in the feedlot, intakes have stabilized, and cattle have adequate body size.** Even on high grain diets, efficiencies decline and costs increase as cattle get heavier. It is estimated that profitability per head decreases $1 for each day cattle are fed past the finish point. Some of the benefit of technologies (ie genetic markers, ultrasound) that determine optimum DOF, is merely the discipline they provide so cattle are not over fed. Heifers are commonly over fed resulting in disappointing performance.

The following guidelines provide examples of how diet transition might change based on cattle type to optimize health, performance, and carcass weight.

Table 1.

Animal type	**Finish weight, lbs**		**Start diet transition at: lb DMI / animal weight (which ever takes longest)***	
	Steers	Heifers	Steers	Heifers
Yearlings[a]	1450	1300	750 (20 lb)	800 (21)
Intermediates[b]	1400	1250	725 (18 lb)	775 (18)
Calves[c]	1350	1200	675 (16 lb)	725 (17)

*For example, if steer calves have reached 16 lbs of DMI but are not yet 675 lbs, delay transition until weight is 675 lbs. If calves weigh more than 675 lbs but intakes have not reached 16 lbs of DM, wait until intakes have reached 16 lbs.

[a]Maximum finish weights (1450 lb steers, 1300 lb heifers) should only be achieved with yearlings

[b]Intermediates include winter placed calves, moderate framed yearlings

[c]Start weaned calves at 1% of body weight, start all others at 1.5%. Weaned calves should receive starter diet with hay until DMI > 2% BW. Then start transition based on above outline.

Once diet transition starts, providing 3 - 4 days on each ration will get cattle on a finishing diet quickly while ensuring a smooth adaptation. On the day of ration change, feed the old ration in the morning, introduce new ration in the afternoon (50:50 split). To maintain consistency and structure in the transition period, consider making ration changes on Mondays and Thursdays.

Feed delivery

Strive for consistency in feed delivery. This means exact ration formulas mixed for the proper length of time. Use batch sheets to ensure accuracy when mixing loads (see example page 15). Enter ingredients in the same sequence each load. Use a stop watch or a rotation counter to ensure loads are consistently mixed.

Minimize crashes in intakes, reduce waste, and achieve and maintain maximum intakes by following a disciplined protocol of feed increases. As intakes climb early in the feeding period (< 50 DOF), smoothly reach a plateau in intakes by making smaller and fewer increases (Table 2). Once cattle are settled in the feedlot (> 50 DOF) and maximum intakes (DMI %BW) have been achieved, DMI (lbs) of yearlings will change very little through the remainder of the feeding period. DMI (lbs) of calves may gradually increase beyond 50 DOF. Following the recommended guidelines will help achieve maximum DMI through the whole feeding period

while avoiding the waste and frustration that results from fluctuating feed deliveries. Once max intakes have been achieved, make small increases (0.2 lb) to avoid the yo-yo deliveries that are commonly observed when people are over reactive when reading bunks.

Table 2. Maximum increases

	< 50 days		**> 50 days**	
	Max increase (lb DM)	**Days between**	**Max increase (lb DM)**	**Days between**
< 1.75	2 lb	0	0.2	1
1.75-2.0	1 lb	0	0.2	1
2.0-2.25	0.5 lb	0	0.2	1
2.25-2.5	0.5 lb	1	0.2	1
2.5-2.75	0.2 lb	1	0.2	1
> 2.75	0.2 lb	2	0.2	1

cleaning up old feed, Sequencing

Projections and backgrounding cattle

Performance and cost projections should be made when determining cattle purchase prices, ingredient values, and most economical feeding programs. Accurate projections are obviously critical when custom feeding on a cost of gain basis. These calculations should be made using net energy content of feeds and net energy equations for estimating performance. These calculations are available on request (see example rations page 15) The cost of gain calculator provided with the bunk manager program is a simple but powerful program that utilizes NRC equations to estimate performance, costs of gain, and establish ingredient values. As limit-fed back grounding rations typically provide the cheapest, most accurate gains, a gain matrix that documents how much feed to provide should be followed (see example page 16).

Ingredient energy contents should be based on analysis where available.

Growth promotants

Implants

Implants are the most consistent, cost effective growth promotants available. Although some aggressive programs can negatively affect carcass quality, the improved performance that results

is typically worth more than the discounts. Implant programs should provide a steady delivery of hormones through the feeding period that will maximize performance with the least effect on carcass quality. This means choosing and timing the proper implant for each cattle type.

Focus and design a program starting with the terminal implant. The terminal implant likely has the most impact on performance as it can enhance intakes and performance at a time when they are starting to decline. The terminal implant should be given 80 - 110 d prior to slaughter. Initial implants may have the biggest affect on carcass quality.

Increase potency of an implant program by using a higher dose implant and/or delaying the terminal implant closer to slaughter (80-90 d). The greater the fat potential of the cattle, the more aggressively they should be implanted.

Table 3. Implants listed in order of potency and where they can fit in an implant program

Order of Potency	Implant	hormone levels	Effective days	Where it can work
1	Synovex Plus, Revalor 200	20 mg estrogen, 200 mg TBA	110	< 140 d British heifers, 2nd implant for 150+ d British heifers
2	Revalor, Component TE*	24 mg estrogen, 120 mg TBA	110	< 140 d exotic heifers & British steers, 2nd implant for 150+ d exotic heifers and British steers
3	Synovex Choice	10 mg estrogen, 100 mg TBA	110	< 140 d exotic steers, 2nd implant for 150+ d exotic steers
4	Compudose	24 mg estrogen	200	pasture cattle.
5	Ralgro Magnum[1]	72 mg zeranol	80-120	1st implant for 160-200 d cattle
6	Synovex, Component E*	14 mg estrogen	90-120	1st implant for 160-200 d cattle
7	Ralgro	36 mg zeranol	60-80	1st implant for 140-160 d cattle

[1]Ralgro may have less negative effects on carcass quality and may work better for exotic steers than an estrogen implant

The following table provides example recommendations based on the doses and effective periods outlined in Table 3 with the assumption that cattle with the most fat potential should be implanted the most aggressively.

Table 4. Implant recommendations for different cattle types.

Animal category	Initial implant	Terminal implant
> 900 lb (100-150 d) cattle		
British heifers	Synovex +, Revalor 200	
Exotic heifers, British steers	Revalor, Component TE	
Exotic steers	Synovex Choice	
> 750 lb (150-180 d) cattle[1]		
British heifers	Ralgro	Synovex +, Revalor 200
Exotic heifers, British steers	Ralgro	Revalor, Component TE
Exotic steers	Ralgro	Synovex Choice
< 700 lb (180-220 d) cattle[2]		
British heifers	Synovex, Component E	Synovex +, Revalor 200
Exotic heifers, British steers	Synovex, Component E	Revalor, Component TE
Exotic steers	Ralgro	Synovex choice

[1]Response to 2 implants may be small for this group. Use the terminal implant if only 1 implant is used.

MGA

Melengesterol Acetate (MGA) is a synthetic, orally active progestin. When fed, release of leutenizing hormone from the pituitary is suppressed resulting in the continual presence of a mature follicle (increased estrogen secretion). Without ovulation, heifers do not cycle or ride.

When estrogen is provided through an implant, much of the benefit of MGA is masked through duplication. However, most trials have shown small benefits to feeding MGA, even to implanted heifers. MGA increases carcass fat and reduces riding and aggressive behaviours. As a result, it may be most beneficial when fed in conjunction with aggressive implant programs such as those that should be used with British heifers.

There is currently a 48 hour withdrawal on MGA that is essentially impossible to follow. Some feedlots are willing to risk the withdrawal based on perceived benefits. A vets prescription is required to feed MGA to implanted heifers. Canada imports US beef where there is no withdrawal.

Medications

Ionophores

Ionophores control coccidiosis, help reduce bloat and acidosis by moderating eating aggression, and can improve feed efficiency and possibly rates of gain (although these performance responses are likely very small in barley-based finishing diets). At under 3 cents/hd/d, an ionophore should be fed in all feedlot diets.

Backgrounding diets

Unless using bloat provocative feeds, there is no advantage to feeding more than coccidiosis control levels (22 mg/kg). If bloat is a potential concern, feed 25 mg/kg in these low energy diets.

Finishing diets

There is no performance advantage to increasing monensin levels from 25 to 33 mg/kg. However, higher levels can moderate eating patterns which can help reduce digestive problems. This is especially beneficial when trying to maximize feed efficiency with aggressively rolled grains and / or low forage levels. Because feed efficiency should always be pursued (aggressive rolling), 33 mg/kg should be fed in most dry-rolled barley diets. In temper-rolled diets, 25 - 28 mg/kg is likely adequate.

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Liver abscess prevention

Feeding practices that result in the best feed efficiencies and lowest costs of gain can also result in the most liver abscesses. Abscessed livers represent a loss to the packers who bid on your cattle, and severe abscesses can even affect profitability to the cattle feeder directly. An investment in liver abscess prevention will more than pay for itself in most cases.

Tylan (11 mg/kg) is affective at reducing liver abscesses. At the same feeding rate, tetracycline is likely not as affective but appears to have similar growth promoting affects. Growth promotion from both antibiotics are probably independent of their affects on liver abscesses in most cases (feeding antibiotics results in improved performance of monogastrics and ruminants on pasture). Tylan is cleared to be fed with Rumensin and has no withdrawal. Tetracycline is not cleared to be fed with Rumensin (requires a vet's prescription) and has a 5 d withdrawal. At the same feeding levels, tetracycline costs about 20% as much as Tylan.

Feeding a higher level (35 mg/kg) of tetracycline may provide similar liver abscess control as Tylan but is still less expensive and may be sufficient to help prevent infections such as footrot. **If the feedlot has the bins to handle a shipping supplement (with no tetracycline) to be fed during the withdrawal period, using tetracycline is likely the most economical alternative.** If footrot is a chronic problem, the higher level

may be worth the investment.

Starter rations

Antibiotics are often fed in starter rations to help reduce respiratory disease. Options include tetracyclines or combinations of tetracyclines and sulfamethazine (AS700, Chlor S 700). Feeding AS700 at cleared levels for 56 d has reduced hemopholosis. Numerous protocols have been used with chlortetracycline such as high initial levels (4 gm/hd/d for a week) followed by 1 g/hd/d for 49 d. **One g/hd/d chlortetracycline for 56 d is a cost effective protocol and avoids use of sulfamethazine that is so easily detected on carcasses.** Providing medication in a separate pellet and delivering the exact treatment rate for the first couple of weeks guarantees proper intakes and helps ensure maximum efficacy. Once intakes have stabalized, medications can be included in the supplement based on average, or predicted intakes.

Because the vet has a better understanding of the injectables being used and potential interactions, it is recommended that the vet be a primary input of what antibiotics are fed in starter diets.

Foot rot

During parts of the year, foot rot is a persistent problem for some feedlots and represents a cost in labor and antibiotics. Where specific pens have many foot rots, 1-2 g/hd/d tetracycline for 1 week can be delivered through the feed as a prevention / treatment option. Elevated levels of some trace minerals can also help prevent the problem. Elevated levels of zinc and / or iodine are thought to be affective preventions by many producers. The following examples are based on supplement fed at 4.5% of ration dry matter. Options listed in (perceived) order of efficacy are:

Chelated zinc: 6.67 kg of 10% proteinate would provide an additional 30

mg/kg in the diet and would cost about 1.2 cents/hd/d.

Inorganic zinc (an additional 5 kg $ZnSO_4$ in supplement provides an extra 87 mg/kg in diet DM) costs about 0.7 cents/hd/d

Organic iodine (1 kg of 7.4% in supplement provides an additional 3.5 mg/kg I in diet (increase of about 7X)). Cost is about 0.2 cents/hd/d.

A combination of organic iodine (1 kg) and inorganic zinc (5 kg) can be provided for under 1 cent per head per day and will provide effective prevention in most cases.

Quality Control

Feed sampling

Forages should be sampled to ensure proper estimation of nutrient levels and required supplementation.

At harvest

Silages should be sampled as harvested with a small sample taken for each 500 tonnes harvested. A composite of these samples will provide a good indication of what is in the pit. More samples are justified only if you can isolate and feed parts of the pit with "unique" crop.

Through the year

Three face samples should be taken through the feeding year to confirm analysis (i.e. one in October, January and April). These samples should be composites of no less than 5 samples taken across the face. Take samples that have not been exposed to the air to ensure accurate dry matter determination.

Dry Matters

Accurate dry matters are essential if dry matter intakes and feed conversions are to be meaningful. Silage samples should be taken twice each month for dry matter determination. If the dry matter differs by more than 3% points from the assumed value, take another sample. If this 2nd sample also differs

by more than 3% points, edit the dry matters being used in computers. Record all dry matters in a spread sheet for easy monitoring and calculating.

Grain processing

Grain processing has a large impact on the economics of finishing cattle. Monitor it regularly. Document each day how aggressive the roll is by using a measurement of bushel weight index or a measurement of fines with a guistimate of the % whole kernels (see page 18).

Whole kernels

To estimate whole kernels, drop a handful on a flat surface and pick out kernels that appear whole. Roll them between your fingers to ensure they are not cracked. Estimate the percent whole kernels. If the same person does this from day to day, this guestimated value becomes meaningful.

Fines

The percent fines provides a good indication of processing in dry rolled barley. About 5% fines resulting from sieving through ~ 1 mm screen are manageable and typically required to reduce whole kernels to an acceptable level. Monitor this daily to maintain consistency in the roll. The screen size is not critical as the primary objective is to maintain consistency from day to day. For a gram scale, a sample of 200 g is required for accuracy within 0.5%.

Bushel-Weight Index

The % fines are typically too low to be meaningful in temper-rolled barley. Use a bushel-weight index (BWI) to measure how aggressive the roll is. The BWI is calculated as:

bushel weight of rolled barley / bushel weight of whole barley * 100.

A BWI of 70% is recommended to achieve best efficiency.

Appendix

Feedlot rations

As Fed Formulas

FEED	DM, %	Starter	1	2	3	4	5
Barley	88.0%	35.73	25.46	34.88	46.23	60.16	77.49
Supplement	93.0%	3.40	2.54	2.77	3.06	3.40	3.84
Silage	38.0%	35.85	72.00	62.35	50.72	36.44	18.67
Hay	86.6%	25.02					
%		100.00	100.00	100.00	100.00	100.00	100.00
$/tonne AF		$88.68	$67.82	$75.53	$84.82	$96.23	$110.43
$/tonne DM		$126.93	$130.14	$132.63	$135.12	$137.61	$140.08
Dry Matter, %		69.87	52.11	56.95	62.78	69.93	78.83
Protein, %		12.83	11.48	11.73	11.97	12.21	12.46
NEm, Mcal/kg		1.66	1.67	1.74	1.81	1.88	1.95
NEg, Mcal/kg		1.03	1.05	1.11	1.17	1.23	1.29
NDF, %	36.44	41.36	36.42	31.48	26.53	21.63	
ADF, %	23.13	26.46	22.47	18.48	14.49	10.53	
Calcium, %		1.05	0.91	0.85	0.80	0.74	0.69
Ca:Phos		2.85	2.30	2.07	1.86	1.66	1.48
Weight, lbs		900	900	900	900	900	900
DM Intake, lbs		18.85	18.85	18.74	18.59	18.41	18.19
AF Intake, lbs		26.99	36.17	32.91	29.62	26.32	23.07
Est. Gain, lbs		2.42	2.47	2.67	2.86	3.03	3.19
Est. F/G		7.78	7.63	7.02	6.51	6.08	5.71
Cost of gain		$0.510	$0.511	$0.478	$0.451	$0.429	$0.410
$/hd/d		$1.24	$1.26	$1.28	$1.29	$1.30	$1.31

Dry Matter Formulas

Barley	88.0%	45.00	43.00	53.90	64.80	75.70	86.50
Supplement	93.0%	4.50	4.50	4.50	4.50	4.50	4.50
Silage	38.0%	19.50	52.50	41.60	30.70	19.80	9.00
Hay	86.6%	31.00					
%		100.00	100.00	100.00	100.00	100.00	100.00

Gain matrix for targeting desired gains.

Ration Starter
D.M.= 69.87 **NEm, mcal/kg =** 1.66 **NEg, mcal/kg =** 1.03

lbs of feed to provide desired gain (lb/d)

	ADG										
Pred. intake	**1**	**1.2**	**1.4**	**1.6**	**1.8**	**2**	**2.2**	**2.4**	**2.6**	**2.8**	**3**
Steers											
300	12.1	7.8	8.5	9.1	9.7	10.4	11.1	11.7	12.4	13.1	13.8	14.5
350	13.6	8.8	9.5	10.2	10.9	11.7	12.4	13.2	13.9	14.7	15.5	16.3
400	15.1	9.7	10.5	11.3	12.1	12.9	13.7	14.6	15.4	16.3	17.1	18.0
450	16.5	10.6	11.5	12.3	13.2	14.1	15.0	15.9	16.8	17.8	18.7	19.6
500	17.8	11.5	12.4	13.3	14.3	15.3	16.2	17.2	18.2	19.2	20.2	21.3
550	19.1	12.3	13.3	14.3	15.4	16.4	17.4	18.5	19.6	20.7	21.7	22.8
600	20.4	13.2	14.2	15.3	16.4	17.5	18.6	19.8	20.9	22.0	23.2	24.4
650	21.7	14.0	15.1	16.2	17.4	18.6	19.8	21.0	22.2	23.4	24.6	25.9
700	22.9	14.8	16.0	17.2	18.4	19.6	20.9	22.2	23.5	24.7	26.0	27.4
750	24.1	15.5	16.8	18.1	19.4	20.7	22.0	23.3	24.7	26.1	27.4	28.8
800	25.3	16.3	17.6	19.0	20.3	21.7	23.1	24.5	25.9	27.4	28.8	30.2
850	26.5	17.1	18.5	19.9	21.3	22.7	24.2	25.6	27.1	28.6	30.1	31.6
900	27.7	17.8	19.3	20.7	22.2	23.7	25.2	26.8	28.3	29.9	31.4	33.0
950	28.8	18.6	20.1	21.6	23.1	24.7	26.3	27.9	29.5	31.1	32.8	34.4
1000	30.0	19.3	20.8	22.4	24.0	25.7	27.3	29.0	30.6	32.3	34.0	35.7
1050	31.1	20.0	21.6	23.3	24.9	26.6	28.3	30.1	31.8	33.5	35.3	37.1
1100	32.2	20.7	22.4	24.1	25.8	27.6	29.3	31.1	32.9	34.7	36.6	38.4
Heifers											
300	12.8	8.7	9.3	10.0	10.6	11.3	11.9	12.6	13.3	14.0	14.7	15.4
350	14.3	9.7	10.5	11.2	11.9	12.6	13.4	14.2	14.9	15.7	16.5	17.2
400	15.8	10.8	11.6	12.4	13.2	14.0	14.8	15.6	16.5	17.3	18.2	19.1
450	17.3	11.8	12.6	13.5	14.4	15.3	16.2	17.1	18.0	18.9	19.9	20.8
500	18.7	12.7	13.7	14.6	15.6	16.5	17.5	18.5	19.5	20.5	21.5	22.5
550	20.1	13.7	14.7	15.7	16.7	17.8	18.8	19.9	20.9	22.0	23.1	24.2
600	21.5	14.6	15.7	16.7	17.8	19.0	20.1	21.2	22.3	23.5	24.7	25.8
650	22.8	15.5	16.6	17.8	18.9	20.1	21.3	22.5	23.7	25.0	26.2	27.4
700	24.1	16.4	17.6	18.8	20.0	21.3	22.5	23.8	25.1	26.4	27.7	29.0
750	25.4	17.3	18.5	19.8	21.1	22.4	23.7	25.1	26.4	27.8	29.1	30.5
800	26.6	18.1	19.4	20.8	22.1	23.5	24.9	26.3	27.7	29.2	30.6	32.0
850	27.9	19.0	20.3	21.7	23.2	24.6	26.1	27.5	29.0	30.5	32.0	33.5
900	29.1	19.8	21.2	22.7	24.2	25.7	27.2	28.7	30.3	31.8	33.4	35.0
950	30.3	20.6	22.1	23.6	25.2	26.8	28.3	29.9	31.5	33.2	34.8	36.5
1000	31.5	21.4	23.0	24.6	26.2	27.8	29.4	31.1	32.8	34.5	36.2	37.9
1050	32.6	22.2	23.8	25.5	27.1	28.8	30.5	32.3	34.0	35.8	37.5	39.3
1100	33.8	23.0	24.7	26.4	28.1	29.9	31.6	33.4	35.2	37.0	38.8	40.7

Based on 1984 NRC equations adjusted to match average closeout values from Southern AB.
Values are estimates only. Genetics, environment, feedlot management, and implant programs will influence accuracy. Accuracy is depedant on accurate feed dry matter and energy values.

Batch Sheets for Mixing Loads

Ration: Starter
% DM = 69.87

Ingrdient	Barley		Supplement		Silage		Hay	
% of ration	35.73%	3.40%		35.85%	25.02%			
Batch Wt.								
500	180	(180)	20	(200)	180	(380)	130	(510)
1000	360	(360)	30	(390)	360	(750)	250	(1000)
1500	540	(540)	50	(590)	540	(1130)	380	(1510)
2000	710	(710)	70	(780)	720	(1500)	500	(2000)
2500	890	(890)	90	(980)	900	(1880)	630	(2510)
3000	1070	(1070)	100	(1170)	1080	(2250)	750	(3000)
3500	1250	(1250)	120	(1370)	1250	(2620)	880	(3500)
4000	1430	(1430)	140	(1570)	1430	(3000)	1000	(4000)
4500	1610	(1610)	150	(1760)	1610	(3370)	1130	(4500)
5000	1790	(1790)	170	(1960)	1790	(3750)	1250	(5000)
5500	1960	(1960)	190	(2150)	1970	(4120)	1380	(5500)
6000	2140	(2140)	200	(2340)	2150	(4490)	1500	(5990)
6500	2320	(2320)	220	(2540)	2330	(4870)	1630	(6500)
7000	2500	(2500)	240	(2740)	2510	(5250)	1750	(7000)
7500	2680	(2680)	260	(2940)	2690	(5630)	1880	(7510)
8000	2860	(2860)	270	(3130)	2870	(6000)	2000	(8000)
8500	3040	(3040)	290	(3330)	3050	(6380)	2130	(8510)
9000	3220	(3220)	310	(3530)	3230	(6760)	2250	(9010)
9500	3390	(3390)	320	(3710)	3410	(7120)	2380	(9500)
10000	3570	(3570)	340	(3910)	3590	(7500)	2500	(10000)
10500	3750	(3750)	360	(4110)	3760	(7870)	2630	(10500)
11000	3930	(3930)	370	(4300)	3940	(8240)	2750	(10990)
11500	4110	(4110)	390	(4500)	4120	(8620)	2880	(11500)
12000	4290	(4290)	410	(4700)	4300	(9000)	3000	(12000)

Grain processing records

Date	% Fines or BWI	% whole kernels		Date	% Fines or BWI	% whole kernels

For best feed efficiency, set rollers to provide a BWI of ~ 70%. 5% fines are manageable in

most dry-rolled finishing diets.

Job description for feed men

For a 10,000 head feedlot, you are delivering about $15,000 worth of feed each day. Feed delivery is a critically important part of the operation - don't underestimate its impact, don't take a casual approach. Feed delivery affects how efficiently the cattle utilize the feed and how much gets wasted.

Strive for consistency

Try to mix the exact same formula with each load of a given ration. This means proper amount of each ingredient added, ingredients added in the same order, and mixed for the same length of time. Use mix sheets to determine how much of each ingredient is to be added to the load.

Add ingredients in the same sequence each load. Usually loads will start with grain or supplement. Make sure supplement is mixed (at least ½ a minute) with grains before forages are added. Let the truck mix while forages are added. Mix for at least 3 minutes following addition of last ingredient. A stop watch helps ensure each load is mixed the proper length of time.

Bunk hygiene

Bunks should be cleaned out regularly to ensure stale or moldy feeds are not affecting intake. Required frequency is dependant on weather and silage quality (silage clumps, spoiled silage, etc.). Shovel bunks after each storm.

Grain processing

Grain processing has a large impact on the economics of finishing cattle. Monitor it regularly. Document each day how aggressive the roll is by using a measurement of bushel weight index or a measurement of fines with a guistimate of the % whole kernels.

Whole kernels

To estimate whole kernels, drop a handful on a flat surface and pick out kernels that appear whole. Roll them between your fingers to ensure they are not cracked. Estimate the percent whole kernels. If the same person does this from day to day, this guestimated value becomes meaningful.

Fines

The percent fines provides a good indication of processing in dry rolled barley. About 5% fines resulting from sieving through ~ 1 mm screen are manageable and typically required to reduce whole kernels to an acceptable level. Monitor this daily to maintain consistency in the roll. The screen size is not critical as the primary objective is to maintain consistency from day to day. For a gram scale, a sample of 200 g is required for accuracy within 0.5%.

Bushel-Weight Index

The % fines are typically too low to be meaningful in temper-rolled barley. Use a bushel-weight index (BWI) to measure how aggressive the roll is. The BWI is calculated as:

bushel weight of rolled barley / bushel weight of whole barley * 100.

A BWI of 70% is recommended to achieve maximum efficiency.