Enhancement of Pre-weaning Performance

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Introduction

When you evaluate the factors influencing profitability in the cow/calf industry, four key points need to be considered.

1. Percent cows weaning calves.
2. Weaning weight of calves.
3. Selling price of calves.
4. Annual cost of maintaining the cow.

Obviously, in evaluating weaning weight, it's important to consider both the percent of cows weaning calves and the actual weaning weight. If the goal is to improve weaning weight it cannot be at the expense of a dramatically reducing percent calf crop. The relationship of these two key profit factors is illustrated clearly in Table 1. Thus, in evaluating weaning weight it's important to look at weaning weight as actual pounds of calf weaned per cow in the herd.

Table 1. Relationship Between Weaning Weight and Percent Cows Weaning Calves—lbs of Calf Produced/Cow.

	Weaning Weight		
Percent Calf Crop	400	500	600
70	280	350	420
80	320	400	480
90	360	450	540
100	400	500	600

In the past 20 years, it is very clear that the cow/calf industry has made considerable progress in improving calf weaning weights. The pounds of calf produced per cow nationally, (figures as summarized by Cattle Facts) were 318 lbs calf/cow in 1960, 449 lbs calf/cow in 1980 and current figures in 1989/90 are projecting 528 lbs calf/cow.

As we evaluate annual cost of maintaining the cow, very little change has occurred in the industry in the past ten years, but the current focus, such as the National IRM Program, will be addressing production costs and how the industry can improve economic efficiency by lowering annual production costs.

The following summary will look at those factors such as management, nutrition and genetics that can influence weaning weight.

Seven factors (in varying detail) will be considered: a) growth promotants, b) creep feeding, c) use of medicated minerals, d) internal/external parasite control, e) age at weaning, f) grazing systems/forage quality and g) genetic capacity to grow.

Growth Promotants

As one evaluates the three key segments of the cattle industry, that being the cow/calf, stocker and feedlot phase, the use of growth promotants varies tremendously between the three sectors. Approximately 85-90 percent of all feedlot cattle are produced in a production system that involves growth promotants. With stocker cattle, because so many systems are used, it appears that about 50-65 percent of the cattle are implanted. Current survey data estimates that only 25-35 percent of suckling calves are implanted. Thus, it is obvious one of the most economical means of improving weaning weight is enhanced use of growth promotants with suckling calves.

1. **What response can we expect from the use of growth promotants?** In 1983 Dr. Terry Mader, University of Nebraska, summarized numerous research trials conducted to that date and the impact of implanting on suckling calf weaning weights was 18.4 lbs of extra weight. The following table illustrates work done since approximately 1985.

   A summary of 19 trials shows that the average response to the four types of implants cleared for use in the cattle industry was 18.6 lbs of improved weaning weight through the use of a single implant.

2. **Does type of implant influence weight gain response?** The following tables break out the research data by implant type. In Table 3, Synovex-C is compared to Ralgro in an eight trial summary. Statistically, there are no differences in the weaning weight response of the two implants.

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Table 2. Effect of Implanting Suckling Calves on Weight Gains (19 trial summary).

Study	No.	Days	Control	Ralgro	Syn-C	Compudose	Calf-oid
Texas, 1988	54	170		(+22.4)			
IMC (JAS,Abst), 1986	195	175	377.1	404.4	400.6		
Virginia Tech, 1985-86	90	196	267	298	279		
Australia, 1987	112	79	114.7	119.9		135.6	
Missouri, 1986	64	182	260			244	
Virginia Tech, 1985-86	59	130	205	214.5®		198	
Florida, 1989	82	210	(+48.4 lbs)				
Louisiana, 1989	228	270	443.5	461.3®		461.1	
Illinois, 1986	336	220	305.8	330	316.8	327.8	
Colorado, 1986	717	153	304.5	320.1	321.8		
Colorado, 1984	116	157	308	338®	333®		
Kentucky, 1984	60	167	266.0	261.0	284.0		
Arkansas, 1989	60	209	308.1				335.7
Michigan State, 1990	540	205	414.1	453.1		440.8	455.1
Kansas	179	164	334.6	342		339.5	
Colorado, 1986	39	168	272.2	301		304	
Colorado, 1986	172	145	298	301		297	
Oklahoma, 1985	239	244	352		374		
South Dakota, 1986	628	163	342.9	356.4	359.6	349.4	
TOTAL:	3960						
AVG:		175.6	Avg. implant response = 18.6 lbs				

® Denotes calves that were re-implanted.

Table 3. Effect of Ralgro vs Synovex-C on Suckling Calf Weight Gains (8 trial summary).

Study	No.	Days	Ralgro	Synovex-C
			LBS	LBS
Nebraska	56	N.A.	334	346
Virginia Tech, 1985-86	60	196	298	279
Illinois, 1986	168	220	330	316.8
Colorado, 1986	520	153	320.1	321.8
Colorado, 1984	116	157	338®	333®
Kentucky, 1984	40	167	261	284
Missouri, 1986	198	172	298	297
South Dakota, 1986	316	163	356.4	359.6
TOTAL:	1474			
AVERAGE:		175.4	316.3	317.2 (+.9 lbs)

In a three trial summary, Ralgro has been compared to the newest implant on the market, Calf-oid. Again, statistically, no difference was noted, but a slight trend favored Calf-oid. In a thirteen trial summary, Ralgro was compared to Compudose with again, statistically, there being no difference in the performance, but a slight edge favored Ralgro.

Table 4. Effect of Ralgro vs Calf-oid on Calf Weight Gain (3 trial summary).

Study	No.	Days	Ralgro	Calf-oid
Michigan, 1990	180	205	453.1	455.1
Missouri, 1987	275	185	278	283
Missouri, 1991	414	165	323.0	332.2
TOTAL:	869			
AVERAGE:		185	351.4	356.8 (+5.4 lbs)

Table 5. Effect of Implanting With Ralgro (some re-implanted) vs. Compudose on Suckling Calf Gains (13 trial summary).

Study	No.	Days	Weight Gain Post Implanting	
			Ralgro	Compudose
Nebraska, 1987	56	N.A.	334[s]	334
Virginia Tech, 1985-86	40	130	214.5®	198
Louisiana, 1989	228	270	209.7®	209.6
Illinois, 1986	168	220	341®	327.8
Indiana, 1984	86	162	358®	353
Australia, 1987	112	79	120.1	135.6
Michigan State, 1990	180	205	453	440.8
Missouri, 1986	56	206	316[s]	330
Missouri, 1986	56	170	317[s]	320
Kansas State, 1983	123	164	354.2®	339.5
Colorado, 1986	19	168	301®	304
Colorado, 1986	146	145	301[s]	297
South Dakota, 86	321	163	356.4[s]	349.4
TOTAL:	1591			
AVERAGE:		173.5 (+2.9 lbs)	305.8	302.9

® = Re-implant
[s] = Single implant

Obviously, as you look at the comparisons that have been done between implant type, the key factor is using implants, not what type of implant to use. Type of implants used will depend on the personal preference of the cow-/calf operators, or veterinarian, doing the implanting.

3. **What benefit would be received from re-implanting the cattle during the suckling period?** Traditionally, in the cattle industry, a single implant has been used at the time the calves are approximately 2-3 months of age with the practice used in conjunction with other procedures such as branding, vaccinating, castration, etc. There still, however, appears to be merit in re-implant-

Table 6. Benefit of Re-implant Suckling Calves on Weight Gains (7 trial summary).

Study	No.	Days	Ralgro		Synovex-C	
			Single	Re-implant	Single	Re-implant
Virginia Tech, 1985-86	118	196	298	284.4	279	288.1
Illinois, 1986	336	220	330	341	316.8	345.4
Kansas, 1983	218	164	342.76	354.2		
Colorado, 1980	39	168	285.6	300.7		
Oklahoma, 1985	357	244			377.4	379.9
Kansas, 1980	105	150	303	301.5		
IMC (Abstract), 1986	260	175	404.4	417.6	400.6	401.1
TOTAL:	1433	188.1	327.3 (+5.9 lbs)	333.2	343.5 (+10.1 lbs)	353.6

ing calves later in the suckling period; particularly if the cattle are going to be worked anyway for reasons such as fly control, or related management strategies. From a seven trial summary, the data shows a 5.9 lb response to a re-implant of Ralgro and a 10.1 lb improvement in weaning weights due to re-implanting with Synovex-C. Both statistically and certainly economically these are advantageous responses that would encourage consideration of re-implant strategies.

4. **The effect of implants on heifer reproduction. A key question regarding implants is their potential effect on replacement heifers.** Some excellent summaries done recently by Dr. Gene Duetscher at the University of Nebraska and Dr. Tim Marshall at the University of Florida have evaluated the effect of implants during the suckling period on subsequent reproductive performance of replacement heifers. Basically, the summary of the recommendations would be as follows:

   a. With any of the current implants cleared, replacement heifers should not be implanted at birth or within the first month of birth.

   b. Implanting at two to three months of age appears to have very little adverse effect on subsequent reproductive performance.

   c. The multiple use of implants, such as, at two to three months of age and again at weaning, generally tends to have some negative impact on subsequent reproduction in the cattle.

   d. In instances where heifers have been kept for later production, there does not appear to be any impaired impact on subsequent level of milk production.

National figures indicate that 16-18% of the cow herd is replaced annually by heifers. Since half the calf crop is heifers, that means 32-36% of the heifers serve as replacements, but 64-68% are sold as stocker heifers. Not implanting these is a 600-700 lb loss in weaning weight/100 cows which is enough extra weaning weight to equal a calf and a half.

Creep Feeding

The concept of creep feeding is basically one of providing extra energy by feeding concentrates or providing a forage creep for suckled calves to supplement their mother's milk. The key is deciding whether to creep feed or not is whether the inclusion of a creep diet will complement the dam's milk production and are calf and grain prices such that it will be economically advantageous to creep.

Let's consider the economic efficiency of creep feeding—when is it likely to pay and when is it not. **Situations where it is often profitable:**

***With fall or early winter born calves.** Creep feeding will often increase the weaning weight of these fall or early winter-born calves to the point that the conversion will be efficient enough to make it economically feasible. Remember that fall and winter-born calves are often left on the cow to an older age such as 9-10 months, which means that the cow's milk production has declined to a fairly low level, and the calf's ability to consume forage is increasing.

***When pastures are poor or in drought years.** Typically in instances where pasture conditions are extremely poor, the cow's milk production will be affected and the quantity/quality forage available for the calf to consume may be limited. In years such as this, it is often economically advantageous to creep feed.

***With first-calf heifers or extremely mature cows.** In a few situations with first-calf heifers or old cows, level of milk production may be inadequate to maintain calf growth which results in the creep ration being fairly efficiently converted to added weight.

***Larger framed cattle or those with considerable genetic growth potential.** These type of calves often have the capacity to grow well beyond the milking ability of the cow. In situations such as this, the use of a creep diet can enhance performance while the calf is on the cow with many of these calves going directly into the feedlot. Further creep feeding may be economically advantageous in that it could possibly shorten the feedlot phase.

***When the price discount for added weight or extra condition is not present or not severe enough to reduce the economic merits.** This is often a difficult question to determine, and may vary greatly from one part of the country to

another. Follow the market closely in your area to make a decision on this economic consideration.

***When grain prices are low and calf prices are high.** Obviously, creep feeding is simply a feed to extra weight gain conversion. As a rule of thumb, use an 8 to 1 conversion to see if it will pay.

***When does it *not* pay?** The inverse relationship of previous mentioned points fits here. Generally in situations where cows are excellent milkers, pasture conditions are good and grain to cattle prices are fairly typical of the industry, creep feeding may be simply uneconomical.

Once you decide on whether to creep feed or not, then four key questions need to be answered.

1. **Should I full feed, or limit feed the creep ration?** Research data has compared full fed creep rations to limit fed rations. Normally the conversion rate on full fed creep diets will be in the range of 6-12 pounds of feed per extra pound of gain if the average daily intake of creep ration is above 3 lbs/hd/day. In situations where you have poor dam milk production, and calf prices are fairly good, a full fed creep may be the most profitable approach.

   Gaining in popularity in many areas is limit fed creep feeding. There are a number of ways to limit creep intake, but one of the most common ones is to add 6-10% salt. This will limit intake to 1-2 lbs/hd/day. Conversions on limit fed diets have been in the range from 3-10 pounds, but usually in the range 3-6 pounds. Oftentimes this conversion is good enough to give a profitable return.

2. **Should I feed a high protein or a high energy creep?** Usually on full fed creep rations, the protein content will be in the range of 14-18 percent. In contrast, with limit fed creep diets, both high energy and high protein creep rations have been used with success. In situations where the forage quality is low and the milk production is low, it may be advantageous to utilize a high protein creep. In contrast, when milk production is fairly good, forage quality is good, then a high energy creep may be advantageous. The following table summarizes three years of research done at Kansas State University comparing high protein and high energy creep rations.

3. **Could I use a forage creep?** Less research exists on the use of forage creeps. But, in situations where a very high quality forage is grown adjacent to the pastures where the cows are maintained, creep grazing can give some improvement in calf gain. Normally forage creeps are not as likely to have as great an impact on calf gains as will grain creeps; however, they do get the calves started eating and fit well in some production systems.

Table 7. The Effect of Limited Creep on Calves' Pre-Weaning Performance.

Item	Control	Protein Creep	Energy Creep
Starting Wt., lbs	376	387	387
60 d ADG, lbs	1.52[a]	1.81[b]	1.74[b]
Dry Matter Intake, lbs	------	1.1	1.4
Conversion of Creep to Extra Gain	------	4.0[a]	6.6[b]
Ration Composition			
Crude Protein, %	------	36	16
Crude Fiber, %	------	11.2	11.5
TDN, %	------	69.5	68.6
Calcium, %	------	.85	.85
Phosphorus, %	------	.85	.85

[ab]Means in the same row with unlike superscripts are different ($P < .01$).

4. **Does creep feeding have a negative impact on subsequent productivity of replacement heifers?** Typically, the recommendation has been to not use creep rations with heifers that will be kept as replacements. That is particularly true in situations where the cows are already good milkers and in situations where a full fed creep will be used where from 3-6 pounds of grain is being consumed by future replacement heifers. It appears that replacement heifers consuming high energy diets from 6-8 months of age do suffer altered udder development, causing lipid-deposition which can severely reduce later milk production.

   Still to be answered is whether limit creep diets affect heifers of excellent growth potential. Research results to date are mixed. An extensive summary of the American Simmental Association data by Montana State showed that the creep fed Simmental heifers had no reduction in subsequent productivity when compared to non-creep fed heifers. Likewise, recent research in Florida has looked at the impact of creep feeding and showed no negative impact of the creep diet on later heifer productivity.

Medicated Mineral Mixes or Medicated Creeps

The use of subtherapeutic levels of antibiotics such as chlortetracycline or oxytetracycline on a daily basis has been a widely debated topic in the cattle industry and in the veterinary profession for years. In parts of the country, because of its value for disease control with diseases such as anaplasmosis, veterinarians have recommended the use of subtherapeutic levels of OTC or CTC at levels such as 350-500 milligrams per head per day. In other instances, because of the relationship of subtherapeutic antibiotic

feeding to potential bacterial resistance in humans and animals, veterinarians have not recommended this as a routine practice.

Thus, when a practitioner or cattleman is making this decision, they need to evaluate their feelings toward subtherapeutic antibiotic use first. In the event they decide to pursue it, what type of response can they expect. The following table illustrates a summary of four trials including two trials that involve four years of study. The average response to feeding OTC/CTC at the rate of 300-500 mg/hd/d was 18.8 lbs which in virtually all instances was economically advantageous.

Table 8 Effect of Medicated Salt Mineral Mix or Medicated Creep on Calf Weaning Weights.

Medicated Mineral Mixes - 4 trial summary

		Weaning Weight or ADG		
Trial	No.	Control	Medicated Mineral	Advantage (lbs)
Kentucky[a], 1985	190	422	448	+26
Nebraska[b], 1989	84	1.75	1.89	+11.8
Kansas[c], 1981	466	452.3	473.8	+21.5
North Dakota[d], 1986	60	486.5	502	+15.5
			Ave.	+18.8

[a]4-yr study, pregnancy rate showed 2.7% advantage with 10.6% less pinkeye observed in cows fed medicated mineral.
[b]Daily CTC consumption = 870 mg/cow/day.
[c]4-yr study, 2 yrs with OTC and 2 yrs with CTC.
[d]2-yr study, ave. CTC intake = 216 mg/cow/day.

Creep Feeding Calves

		Weaning Weight or ADG			
Trial	No.	Control	Medicated Creep	CTC intake	Advantage
Nebraska, 1987	80	461.8	450	20 mg/calf/day	-11.8
Nebraska, 1975	152	1.31	1.59	70 mg/calf/day	+27.9

If pursued, OTC-50 or CTC-50 is added at the rate of 8-10 percent to the mineral mix. It was anticipated that daily intake would be .15-.2 lb/hd/d resulting in 300-500 mg/hd/d of antibiotic consumption. As a note, it's important to remember that antibiotic is fairly bitter, and subsequently mineral intake will be reduced. In some instances 4-8% of a palatability enhancer such as soybean oil meal, molasses or related ingredients can be added to the mineral mix to offset the harshness of the antibiotic flavor.

Yet, another way of getting antibiotic into the calves is via creep feed, if a creep ration is utilized. Commonly the desired goal, when fed directly to the calf, is a daily intake of 50-70 mg/hd/d.

Internal/External Parasite Control

It's been estimated that horn flies alone cause the cattle industry an annual production loss in excess of $700 million annually in the United States (Arther, 1991). Both internal and external parasite control are important management considerations that most successful producers routinely incorporate into their program. Depending on the part of the United States, there is considerable variability in terms of the economic impact of flies and, likewise, the impact of internal parasites. Simultaneously, many methods of control for both internal and external parasites exist.

Depending on the part of the country you are in, another question commonly asked by cow-calf producers is: "Is it cost effective to deworm my cow herd?" Deworming is a more widely accepted practice in the southern and southeastern part of the United States than in the midwest or western half of the United States where routine dewormings of cows is only practiced by a small percentage of the producers. To date, research results with deworming cows has shown somewhat variable responses. For example in summarizing a 9-trial study done in Nebraska, the response varied from no response upwards to a 30 pound improvement in calf weaning weight. The average for the nine trials was about 10-12 pound improvement in average daily gain.

In a two-year study in North Dakota, researchers used a couple different deworming strategies and found that deworming cows resulted in an average improvement in calf-weaning weight of 15.5 pounds.

In many beef cattle operations, it may be equally important to not overlook the replacement heifer when developing a deworming strategy. Recent research at Kansas State University (Corah, *et al.*, unpublished) showed dewormed replacement heifers had a 17.8 percent improvement in the percent cycling at the start of the breeding season. This could in part be explained by a slight improvement in average daily gain; however, it appeared deworming exerted an influence on the onset of puberty in other endocrological/metabolic ways.

With the advent of insecticide impregnated ear tags in the 1980's and their widespread adoption in the 80's, research more clearly has identified the adverse effect of flies on weaning weight. Typically, the research results show a 10-25 pound decrease in weaning weight when fly control **was not possible.** An example of this is the work reported in 1984 by Kentucky workers who showed a 12.3 lb improvement in weaning weight during a 112 day period when Permectrin fly tags were utilized to successfully reduce the horn fly population.

5. **Age at Weaning.** One of the major impacts on calf weaning weight is simply the age of the calf when weaned. As we have selected cows for higher levels of lactation, either through the infusion of heavier lactating breeds of cattle or through the use of milk EPD's we have gradually increased not only the level of milk production, but duration of milk production.

Currently in many production systems producers are often able to keep calves on cows until the calves are 240-260 days of age and, in some fall calving situations, it's not uncommon for calves to stay on the cows upwards to 300 days. In this fall calving situation, calves are able to utilize some of the milk that still exists while starting to develop foraging capabilities on their own which often results in some excellent spring and early summer gains. In this type of production system, the cow is able to capitalize on a higher plane of nutrition through summer grazing and will still enter the calving season in excellent body condition.

In contrast, with spring calving, one of the adverse effects of leaving the calf on the cow is the negative impact on the cow's weight and body condition which is difficult to replenish during the winter supplementation period. An example was work done in Michigan in which they weaned on September 5 as compared to November 22. The calves left on the cow gained 108 lbs during this period as compared to those weaned into drylot gaining 115 lbs. However, the later weaned cows only maintained weight, while those that had calves weaned earlier gained 36 lbs.

Research in Iowa compared weaning on October 20 to weaning calves on December 1. The calves left on the cows were creep fed and actually gained .18 lbs more-/day than calves weaned earlier and put on a growing program. In contrast, the cows late weaned lost weight, while the early weaned cows gained as would be expected.

In these studies the cows were not supplemented which may be an important consideration in trying to use dormant grass or residue fields. In a Montana study, cows supplemented (.75 lb crude protein/cow-/day) after calves were removed had an increased body condition score of 1.25 while unsupplemented cows maintained body condition. Unsupplemented cows with calves weaned in December lost 1.4 units of a body score.

These data in addition to other data, would imply that calves left on cows of average to above average milk production may gain weight during this fall period, but at the expense of the cow losing body weight and body condition.

Particularly in spring calving herds, two strategies appear to be more commonly discussed by cattlemen and are actually being implemented by some very progressive operations. **Strategy one** has the cows calving at a later date in the spring with calves weaned earlier in the fall or at the normal weaning time which results in the average weaning age of the calves being in the range or 170-180 days. In this production system, the ranchers try to take advantage of winter grazing of dormant pastures or residue fields reducing the amount of hay or supplement fed. The cows usually calve in a slightly thinner condition, but capitalize on spring forages to maintain reproductive efficiency and maintain growth rate of the calves. In this strategy, many operations have made significant reductions in the amount of hay and supplement fed, dramatically reducing the annual cost of production.

Strategy two: Another thought process being considered by cattlemen is that with EPD information currently available, one of the strategies is to put considerably greater emphasis on EPD's for growth on both the sire and maternal side of the pedigree resulting in a calf with a greater genetic capacity to grow. This may conceivably still allow weaning weights in excess of 500 pounds, but the calves are weaned at an age of 150-180 days. In this scenario, we'll need to have calves with the genetic capacity to grow while on the cow at a rate of 2.5-2.7 lbs/hd/d. Based on performance currently being achieved, this is certainly not unreasonable, as cattle herds with stacked up pedigrees on both the maternal and sire side, are achieving growth rates in excess of 2.5 lbs/hd/d, resulting in calves weaned at 160 days of age in excess of 500 lbs.

6. **Effect of Forage Quality or Grazing Systems.** One of the most notable impacts that has been well researched has been the dramatic impact of endophyte infected fescue on reducing weaning weights. Recent advances have shown that through the use of endophyte free fescue, or through the incorporation of legumes or through management strategies that minimize the endophyte effect, weaning weights can be improved by 40-70 lbs.

   In addition, one of the more debatable topics among range and forage scientists is the question of rotational grazing versus continuous grazing. A number of excellent reviews have evaluated short duration rotation grazing systems on weaning weight. The general consensus of this research appears to be that short duration grazing systems increase the carrying capacity of the range, but this is done at some expense in reduction of calf weaning weight. In an excellent review by Holecheck (1989), all eight studies in rotational grazing reported reduced calf weaning weight (average was 24.5 lbs/calf/trial.).

7. **Genetic Capacity of the Calves to Grow.** When we look at all the factors that have influenced the dramatic increase in calf weaning weight in the United States in recent years, there is no question that two key factors are most prominent.

a. Through the selection for increased milk production within breeds and the introduction of breeds with higher milk producing capabilities, we have seen an increase in the level of **milk production** in today's beef cow.

b. The recent work of population geneticists has allowed us to calculate expected progeny differences (EPD's) for weaning and yearling weight which has improved the accuracy of superior genetic selection of bulls resulting in bulls of superior growth potential being utilized by producers.

There is absolutely no doubt that in the cattle industry we are in a better position to genetically manipulate the type of cow we want to maintain in a production system, and equally, through proper attention EPD's select bulls of superior growth traits.

Do these selection procedures work? A recent excellent study at Georgia compared conventional trait selection as compared to strictly selecting bulls based on genetic information such as EPD's. Through selection based on EPD's they showed a 68 lb improvement in average weaning weights and a 95 lb improvement in yearling weights over a six year time period.

Summary

Over the next 5-10 years there is little doubt that beef cattle will be focused on economic efficiency and cost of production. It is quite conceivable that with this focus on cost of production and with the current level of productivity of our cows, the cattle industry may be able to achieve the production of calves at a cost of less than 50¢ per pound. To achieve this, it's going to mean a reduction in the annual maintenance cost of the cows without sacrificing reproductive efficiency, or the progress that's been made in improved weaning weights.

Literature Citation

Reference List: Growth Promotants

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Abstracts

Observation on bovine congenital erythrocytic protoporphyria in the blonde d'Aquitaine breed

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Veterinary Record (1991) **129,** 403-407

Three blond d'Aquitaine calves (one male and two females) about four months old, exhibited skin lesions just after birth, the site and nature of which suggested photosensitisation. Their prophyrin metabolism indicated a marked decrease in the activity of lumphocytic ferrochelatase, leading to a diagnosis of congenital erythrocytic protoporphyria. The associated nervous disorders of the 'recurrent epileptiform seizure' type are discussed in the light of complementary histological and biochemical tests.

N-acetyl- β-D-glucosaminidase test for screening milk samples for subclinical mastitis

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Veterinary Record (1991) **129**, 507-509

The use of the N-acetyl-β-D-glucosaminidase (NAGase) test for detecting subclinical mastitis was investigated in surveys of milk samples from 20 farms. A milk sample was considered to be mastitic if it had a milk cell count above 400,000 cells/ml, and the NAGase test results were graded accordingly. The test gave an average of 16·6 per cent false positives and 2·0 per cent false negatives per herd. It was concluded that the NAGase test could be used as a rapid screening method for selecting suspect samples for further analysis by standard methods.