OUT-OF-SEASON BREEDING USING THE EAZI-BREED CIDR-G IN EWES

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INTRODUCTION

The sheep industry in the US has been on the decline for many years. Recently, both price and demand for lamb products have risen, but parasites and predators still plague the industry. Increased demand has been associated with a simultaneous increase in the importation of lamb and lamb products. The survival and regrowth of the industry requires that producers increase their production efficiency with the use of improved technologies so that they are better poised to take advantage of the improved consumer demand for lamb products.

For more than 60 years attempts have been made to synchronize the period of sexual receptivity, or estrus, in farm animals. Synchronization of estrus can save labor and is a key component in artificial insemination (AI) programs. AI is not widely used in sheep in the US due to the often low success rate with frozen ram semen and the lack of performance data to identify superior rams. Despite the very low rate of adoption of AI, interest in synchronization of estrus (particularly for out-of-season breeding) remains high among sheep producers. Synchronized breeding leads to synchronized lambing, thus concentrating and reducing the labor requirements at lambing. The more uniform lamb crop facilitates both management and marketing of lambs. Marketing costs are reduced because of fewer weight/age groups to market. Lower lamb mortality can be achieved due to greater observation during the first three days of life when the danger of mortality is highest. In addition, in a West Virginia study that used progesterone and ram introduction to aid out-of-season breeding, lamb mortality to predators was reduced in the fall-born lambs to half that observed in spring-born lambs in the same and similar flocks.

Lamb production has been a seasonal enterprise for most producers. Ewes are typically bred in the fall (when reproductive activity and ovulation rate are greatest) and lamb in the spring. As a result, there are wide monthly fluctuations in both the numbers of lambs available and in the prices received by producers. Seasonal lambing patterns affect prices, as many producers are marketing lambs during the same time period. Further, the inconsistent supply reduces the efficiency of lamb processors and results in periods of low availability to the consumer.

Typically, farmers may expose their ewes to rams during the fall breeding season for the equivalent of two (35 days) or three estrous cycles (51 days). When exposed to rams for the equivalent of three estrous cycles, 90 to 95 percent of ewes lamb within a 60-day period. With synchronization of estrus, a similar percentage of ewes conceive and lamb as with natural, random mating. However, lambing occurs in three shorter and more concentrated lambing periods of about 7, 10 and 10 days, with approximately 10-day intervals between these periods. This is because ewes are bred initially in a short period of two or three days, and those that do not conceive to first service remain synchronized and return to estrus within another short interval of about 5 days, an average of 16 to 17 days after the first breeding. The breeding period can be shortened to about 37 days, because the first service opportunity for all ewes occurs within the first three days.

Ewes of the same breed-type that were bred in a single day usually lamb in a 7-day period and those bred over a 3-day period lamb during a period of ten days or less. Therefore, knowing the average gestation length (about 146 days in most flocks in this region), the producer using synchronized estrus can predict the days when most lambs will be born and can schedule lambing to occur when it is most convenient. In addition, knowing expected lambing dates in advance allows producers to target specific markets.

One technology used routinely by producers outside the US that was approved in October 2009 for use in the US for out-of-season breeding is an intravaginal insert for delivery of progesterone, the CIDR-G developed in New Zealand.

Induction of estrus in ewes during the non-breeding season (spring/summer) to achieve lambing in the fall has been attempted with limited success. Such programs have been aimed at increasing the number of lambings per year (3 every 2 years), taking advantage of seasonally high prices, and (or) making more efficient use of labor and other resources. However, selection for the ability to lamb from breeding in May was effective in increasing the response to introduction of rams was successful in studies by Dr. Dave Notter and his group at Virginia Tech.

STUDIES ON FARMS THAT LED TO APPROVAL OF THE CIDR-G AS AN AID IN OUT-OF-SEASON BREEDING

Among hormonal approaches to synchronizing estrus in ewes, intravaginal delivery devices for progestogens are easiest to use and have generated the most interest in recent years. The CIDR-G (300 mg progesterone) was developed in New Zealand for use during the breeding season with a 12-day treatment. It became of interest to evaluate its effectiveness in ewes during the non-breeding season in the US. It was approved by FDA in 2009, based on studies of its effectiveness when used preceding ram introduction for out-of-season breeding. These studies were carried out by West Virginia University in West Virginia, Pennsylvania and Ohio flocks. Because the release of progesterone from the intravaginal devices decline with time and American ewes are larger than those in New Zealand, it was decided that short-term treatments might be beneficial.

Even when ewes are induced to ovulate and show estrus during the nonbreeding season, ovulation rates and litter sizes (prolificacy) are lower than those observed during the breeding season. The hormone equine chorionic gonadotropin (eCG or PMSG), which has follicle stimulating hormone (FSH)

activity in ruminants is widely used in other countries, but no eCG preparation is currently approved for use in livestock in the US. The natural hormone FSH is conditionally approved for use in super-ovulation protocols in cattle, thus it was of interest to evaluate the use of FSH in combination with progesterone pre-treatment and ram introduction for possible future use to increase litter size in ewes mated during the non-breeding season.

Experiment 1. **Tests of an intravaginal insert with and without FSH.** This study was conducted in 1998 with 382 ewes on six farms during the anestrous period (May to July). Eighty-four of these ewes were determined to have high progesterone in blood (thus these ewes had been undergoing estrous cycles) and were removed from the study. The remaining ewes were assigned to one of four groups. One group received progesterone from an intravaginal releasing device for 12 days (P12) alone or with a single injection of FSH (55 mg) on day 11 (P12F). Another group of ewes was assigned to receive the progesterone-containing insert for 5 days with FSH on day 4 (P5F), while the fourth group was exposed to rams only (C). Fertile rams with painted briskets were introduced to ewes at the time of insert removal at a ewe to ram ratio of 15:1. Blood samples were collected throughout the treatment period, ewes were observed for estrus, and pregnancy rates and litter sizes were recorded.

The intravaginal insert did not increase concentrations of progesterone in the blood of the ewe as high as concentrations seen during the luteal phase of the estrous cycle. In ewes treated for 12 days, the concentration of progesterone declined rapidly after the first 4 days, and was not different from that of untreated ewes by day 12. With either progesterone treatment, 74% of ewes showed estrus during the first 5 days after ram introduction compared to 12% in ewes introduced to rams only (Table1). The mean time from introduction of rams to estrus was 42 hours and did not differ with duration of treatment with progesterone.

Table 1. Summary of reproductive performance of anestrous ewes in response to ram introduction (C), or ram introduction + 12-d progesterone pre-treatment (P12), 12-d progesterone pre-treatment + FSH (P12F) or 5-d progesterone pre-treatment +FSH (P5F).

Variable \ Treatment	C	P12	P12F	P5F
N	73	73	71	77
Ewes marked by rams,%	12[a]	77	66[b]	79
Ram introduction to raddle markings, h	56[a]	42	40	43
Pregnancy rate[1],%	3[a]	50	44	48
Conception rate[2],%	10[a]	63	61	56
Pregnancy rate[3] 2nd service period:	50	63	60	61
Ovulation rate[4]	-	1.9 ± 0.1	2.2 ± 0.2	2.2 ± 0.2
Percent ewes lambing:				
(a) From 1st service period,%	0[a]	45	38	42
(b) Both service periods, %	41[a]	66	64	63
Lambing rate[5]:, mean ± SE				
(a) Lambing to 1st service period	-	0.74 ± 0.1	.72 ±.1	0.75 ± .1
(b) Both service periods	0.6 ± 0.1[a]	1.0 ± 0.1	1.1 ± 0.1	1.1 ± 0.1
Prolificacy[6], Mean ± SE:				
(a) Lambing to 1st service period	-	1.6 ± 0.1	1.9 ± 0.1	1.8 ±0.1
(b) Lambing to both service periods	1.5 ± 0.1	1.5 ± 0.1	1.6 ± 0.1	1.8 ± 0.1
Ram Introduction to lambing, days	165 ± 2[a]	152 ± 1	153 ± 1	153 ± 1

[a] (progesterone vs control, $P < 0.01$), [b] (P12F vs P5F, $P < .05$) values in same row without common superscript differ.

[1] Number of ewes diagnosed pregnant on d 26 - 31 as a percentage of all ewes in a treatment group.

[2] Number of ewes diagnosed pregnant on d 26 - 31 as a percentage of ewes marked by rams.

[3] Number of ewes pregnant on d 46 – 51 expressed as a percentage of ewes not pregnant on d 26 – 31.

[4] Number of CL observed in ewes diagnosed pregnant on d 26-31.

[5] Lambs born per ewe exposed.

[6] Lambs born per ewe lambing.

The percentages of ewes lambing to the first (42%) and to both first and second service periods (64%) in progesterone-treated ewes were not affected by duration of progesterone treatment. In ewes introduced to rams only, the values were 0 and 41%, respectively (Table 1). Therefore, treatment with progesterone increased the overall proportion of ewes lambing by 23 percentage points.
Ewes lambing to the first service period that were treated with progesterone and given an injection of FSH had a larger litter size (0.2 to 0.3 more lambs born per ewe lambing) than ewes exposed to rams only (Table 1). Ewes treated with progesterone lambed earlier and in a more synchronized pattern (Figure 1). The majority (60 to 70%) of progesterone-treated ewes that lambed did so during the first 8 days of the lambing period. There was no lambing between days 9 and 15, but another period of lambing occurred between day 16 to 25. Ewes introduced to rams lambed continuously between days 14 and 29 of the lambing period.

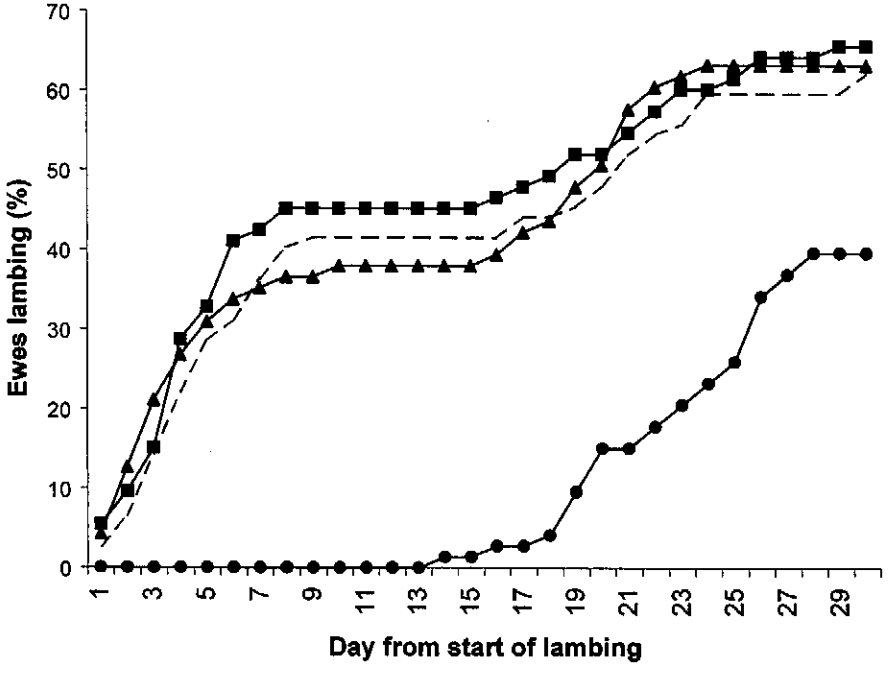

Figure 1. Cumulative percentages of ewes lambing in control ewes (C, ●), ewes pre-treated with PCL inserts for 12 d without (P12, ■), or with FSH 24 h before insert removal (P12F, ▲) and ewes treated with PCL inserts for 5 d with FSH 24 h before insert removal (P5F, – –).

Experiment 2. **Examination of short-term treatment with the CIDR-G.** In experiment 1, treatment for 5 days seemed to be equally effective as treatment for 12 days. Experiment 2 was aimed at testing the efficacy of a 5-day treatment with the CIDR-G device with or without FSH given one day before removal of inserts compared to introduction of rams only. In this study, conducted in 1999, a total of 653 ewes on 7 farms were assigned to be controls (C; introduced to rams only), or to receive the CIDR-G device for 5 days, alone (P5) or in combination with an injection of FSH 1 day before insert removal (P5F).

The results of this study were similar to those obtained in experiment 1 (Table 2). More ewes treated with progesterone (P5 and P5F) were marked by rams during the first 3 days after ram introduction (77 vs 20%), and lambed to the first (46 vs 0%) or both services (63 to 67 vs 45%). Thus an additional 18 to 22% of the ewes treated lambed due to progesterone pre-treatment. Ewes that were treated with FSH and lambed to the first service tended to have a larger litter size than ewes not treated with FSH and control ewes.

In both studies, the response varied among farms and to a limited extent with the face color of the ewe (Table 4). The greatest responses in terms of overall ewes lambing were observed in white-faced ewes (69%) other than North Country Cheviots. Although only a few North Country Cheviot ewes were studied, none of these ewes lambed in response to treatment.

Experiment 3. **Effects of dosage, vehicle, and injection time on the response to FSH.** In a third experiment, conducted during 2000, different dosages of FSH, vehicles for the FSH and times that FSH was injected relative to removal of the intravaginal insert were examined. Although dosages of FSH of 42 or 68 mg increased ovulation rate slightly when given 12 hours before insert removal, numbers of lambs born were not increased in most flocks. Vehicle did not affect the response, but injection of FSH 36 hours before insert removal was ineffective.

Table 2. Summary of reproductive performance of anestrous ewes in response to ram introduction (C), or ram introduction + 5-d CIDR pre-treatment without (P5) or with FSH (P5F).

Variable/Treatment	C	P5	P5F
N	125	257	271
Ewes in estrus[1], %	20	75 [a]	79 [a]
Ovulation rate	-	1.95 ± .1	1.96 ± .1
Conception rate[2], %	0	70 [a]	66[a]
Pregnancy rate, %			
First service period[3]	0	53 [a]	52 [a]
Second service period[4]	57	45	54
Percent ewes lambing, %			
From first service period	0	46[a]	46[a]
To both service periods	45	63[a]	67[a]
Lambing rate[5] (mean ± SE)	-	.68 ± .1	.77 ± .1
First service period	.7 ± .1	.96 ± .1[a]	1.07 ± .1[a]
Both periods			
Prolificacy[6] (mean ± SE)	-	1.5 ± .1	1.67 ± .1
First service period	1.52 ± .1	1.47± .1	1.47 ± .1
Second service period	1.52 ± .1	1.49 ± .1	1.6 ± .1
Overall			

[a] ($P < .001$), [b] ($P < .05$) values in same row without common superscript differ

[1] Number of ewes marked by raddled rams as a percentage of all ewes treated

[2]Number of ewes diagnosed pregnant on d 26 - 31 as a percentage of ewes exhibiting estrus.

[3]Number of ewes diagnosed pregnant on d 26 - 31 as a percentage of all ewes treated.

[4]Number of ewes pregnant on d 46 – 51 expressed as a percentage of ewes not pregnant on d 26 – 31.

[5]Lambs born per ewe exposed.

[6]Lambs born per ewe lambing.

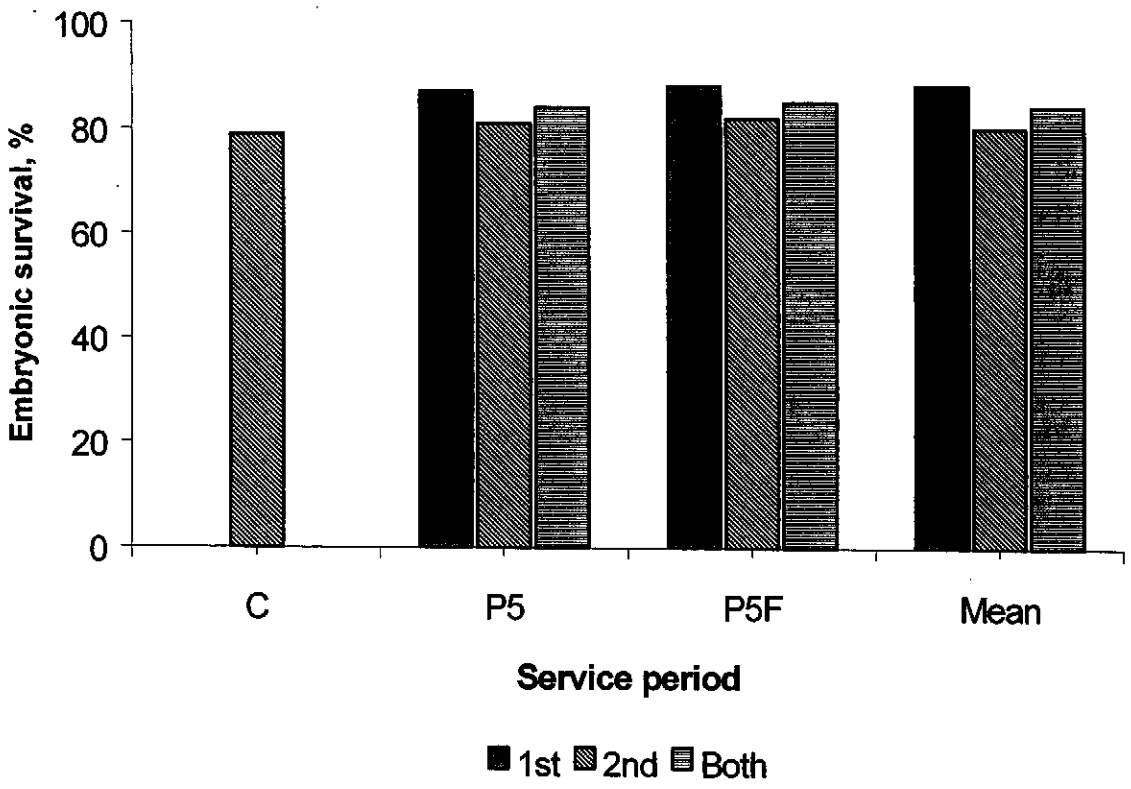

Figure 2. Embryonic survival rate: Percentages of ewes lambing as a percentage of ewes diagnosed pregnant as a result of matings at the first, second, or both service periods after ram introduction, for control ewes (C), ewes pre-treated with CIDR devices for 5 d without (P5), or with FSH 24 h before insert removal (P5F).

Overall, it was concluded that progesterone treatment before ram introduction can be used to induce a synchronized fall lambing in the majority of ewes, which can allow producers to take advantage of seasonally higher lamb prices. Increases in litter size were not sufficient to justify the addition of FSH to the treatment regimen of progesterone and ram introduction.

Lactating Ewes: A Limiting Factor During Anestrus

Lactation has little or no inhibitory effect on the ability of ewes to exhibit reproductive cycles during the breeding season. Estrus accompanied by ovulation

occurs about 35 days after parturition in fall-lambing ewes, regardless of whether they are suckling lambs or non-lactating. However during anestrus, lactating ewes usually respond poorly to attempts to induce breeding activity by ram introduction or treatment with progestogens. In recent studies, effects of lactation on response to treatment with progesterone were examined in ewes that were treated in early July. The lambs had been weaned from ewes in one group and ewes in the other group were in the second and third month of lactation. All ewes received CIDR devices for 5 days before introduction of rams.

In experiment 1, 105 weaned ewes and 53 lactating ewes were studied. Half of each group received an additional treatment of 30 micrograms of estradiol benzoate in 1 mL corn oil 24 hours after insert removal and ram introduction. The other half received 1 mL corn oil. Weaned ewes had higher pregnancy rates by ultrasonography at 26 to 30 days after first (59%) or second service (74%) periods than the lactating ewes (38 and 44%, respectively). Thus 81% of the weaned ewes, but only 44% of the lactating ewes lambed. Lambs born per ewe exposed (lambing rate) averaged 1.26 and 0.61, respectively. Lambing rate was higher in ewes treated with estrogen, (1.1) than in ewes receiving corn oil (0.8). In experiment 2, 106 weaned ewes and 44 lactating ewes received either 0, 15 or 30 micrograms of estradiol benzoate 24 hours after insert removal and ram introduction. Again, more weaned (76%) than lactating (27%) ewes were pregnant to first service. More weaned (82%) than lactating (27%)ewes lambed, and lambs born per ewe exposed averaged 1.25 and 0.31, respectively. Treatment with estrogen increased pregnancy rate to first service and ewes lambing in weaned, but not in lactating ewes.

In conclusion, currently available methods are not suitable for induction of breeding out-of-season in lactating ewes. During March or April through July, it is recommended that lambs be weaned for at least 10 days before initiation of treatments to induce a fertile estrus.

Studies on Synchronizing Estrus during the Breeding Season.

Synchronizing estrus during the normal breeding season provides a means for producers to schedule the lambing period, concentrating labor needs into a short time-frame. Estrous synchronization also can help in improving the uniformity of the lamb crop for market.

The use of intravaginal progesterone inserts for a period equivalent to the lifespan of the CL (12 to14 days) has resulted in reduced fertility in some studies. The low amount of progesterone released by a single device was unable to completely maintain a low frequency of release of LH towards the end of the treatment period. A higher frequency of release of LH leads to an earlier increase in estrogen in relation to the time of ovulation. The result is ovulation of an older follicle, in which the egg may have begun to undergo degenerative changes, based upon studies in cattle and two studies in ewes (however, one other study in Ireland did not find decreased fertility in ewes treated with a lower dosage of progesterone).

Experiment 1. **Effect of a CIDR for 5 days with Prostaglandin $F_2\alpha$.** We compared ewes given prostaglandin alone to ewes given a single CIDR-G device for 5 days before injection of $PGF_2\alpha$. The 5-day treatment with CIDR-G plus $PGF_2\alpha$ should synchronize estrus without decreasing fertility, because this treatment should maintain high circulating concentrations of progesterone during the short treatment period. At the same time, it should block ovulation so that ewes will have either no functional CL or CL that are susceptible to $PGF_2\alpha$ (more than 5 days old). Four hundred and sixty (460) ewes on 4 farms were used in this study conducted between late August and December, 1999. Ewes were given a CIDR –G device for 5 days and given an injection of prostaglandin (Lutalyse 20 mg) 18 hours before or at insert removal. A third group of ewes were given a single injection of prostaglandin only.

The results from this experiment are presented in table 3. The estrous response was highest in ewes given a CIDR-G device and $PGF_{2\alpha}$ at insert removal (93%), lowest in ewes given prostaglandin only (72%) and intermediate in ewes treated with CIDR-G devices and given $PGF_{2\alpha}$ 18 h before insert removal.

The conception rate to first service was lower in the ewes given prostaglandin alone (52%) than in the ewes receiving a CIDR-G device and PGF_{2} (at insert removal (75%), while the conception rate was intermediate in ewes receiving PGF_{2}(18 h before insert removal (66%). The overall pregnancy ratefrom the two service periods was 86% and was not different among the 3 treatment groups. The litter size averaged 1.68 and did not differ among groups.

Unexpected Findings: Late Embryonic and Fetal Mortality

During the recent studies in out-of-season breeding, pregnancy was diagnosed by ultrasonography of the reproductive tract of the ewes at 26 to 30 days after first and second service periods. In combination with the data for lambing, the data for pregnancy status at 26 to 30 days allowed us to estimate pregnancy retention. In out-of-season experiment 1, 91% of pregnancies to first service were retained to lambing and 73% of pregnancies resulting from the second service period were retained. Similarly, in out-of-season experiment 2, pregnancy retention rates were 88 and 80%, for first and second service periods, respectively.

These findings stimulated further studies of the numbers of embryos or fetuses present at 25, 45, 65 and 85 days after breeding and numbers of lambs born in both the breeding and non-breeding seasons. In 2000 and 2001, a total of 957 pregnant, non-lactating ewes of mixed breeding on 9 cooperating farms, bred either in early May and June (anestrus, season 1) or in late July, August or September (transition, season 2), were examined by ultrasonography. Late

Table 3 Reproductive performance of ewes in response to 5-day progesterone treatment + $PGF_{2\alpha}$ at insert removal on day 0 or $PGF_{2\alpha}$ alone (Experiment 3).

Treatment		
Variable	Progesterone + $PGF_{2\alpha}$	$PGF_{2\alpha}$ only
Number of ewes	**519**	**495**
Proportion of ewes with raddle marks[1] (%)	**429/518 (82.8)**	**308/494 (62.3)**
Ewes pregnant to first service (%) [2]	**267/376 (71.0)**	**194/332 (58.4)**
Ewes conceived to the first service (%) [3, a]	**241/315 (76.5)**	**143/210 (68.0)**
Pregnancy rate to second service (%) [4]	**84/102 (82.3)**	**103/135 (76.3)**
Number of ewes lambing: [b]		
(a) From first service period (%)	**259/435 (59.5)**	**191/404 (47.3)**
(b) Both service periods (%)	**369/435 (84.8)**	**324/404 (80.2)**
Lambing rate[5], mean ± SE:		
(a) Lambing to first service period	**408/434 (.94)**	**276/402 (.69)**
(b) Both service periods	**575/434 (1.32)**	**493/402 (1.23)**
Prolificacy[6, c], mean ± SE:		
(a) Lambing to first service period	**1.58 ± 0.60***	**1.45± 0.56**
(b) Both service periods	**1.56± 0.61**	**1.52 ± 0.59**

* $P < 0.05$, ** $P < 0.01$

[1] Two ewes did not have data on occurrence of estrus.

[2] Number of ewes diagnosed pregnant on d 25-45 as a percentage of all ewes in a treatment group, on 5 farms.

[3] Number of ewes diagnosed pregnant on d 25-45 as a percentage of all ewes marked by rams during the first service period, on 5 farms.

[4] Number of ewes lambing expressed as a percentage of ewes diagnosed nonpregnant on d 25-45, for which lambing data were available, on 4 farms.

[5] Lambs born per ewe exposed.

[6] Lambs born per ewe lambing.

[a] Not all pregnant ewes were recorded for raddle marks by rams during days 1 through 3.

[b] Lambing data were not available for one farm (173 ewes) and for 3 ewes on another farm.

[c] Three ewes that lambed did not have data recorded for number of lambs born.

embryonic and fetal mortality was determined from these counts and numbers of lambs born. Breeding season and service period did not affect losses at any stage of pregnancy.

Individual embryos or fetuses were lost from multiple pregnancies, as well as complete losses of either single or multiple pregnancies. In fact, more ewes lost one or more, but not all, embryos/fetuses from day 25 to term than experienced complete loss of a pregnancy (Figure 4). Losses of potential offspring were continuous throughout gestation, with 4.3% of ewes experiencing loss of one or more embryos from day 25 to 45, 5.1% losing one or more fetuses from day 45 to 65, and 10.2% from day 65 to term. Mean losses of embryos or fetuses averaged 3.3% from day 25 to 45, 2.7% from day 45 to 65, 2.3% from day 65 to 85, and 8.5% from day 85 to term.

Treatment with FSH increased the proportion of potential offspring (number of corpora lutea) not represented by lambs born (0.25, 0.55 and 0.71 for 0, 42 and 62 mg of FSH, respectively). Late embryonic or fetal mortality totaled 18.5% from day 25 to term in the current study. Estimated total loss of potential offspring from determination of ovulation rate to lambing was 22.4%. By difference, only approximately 4% of potential offspring were lost from ovulation to day 25 of gestation in those ewes that were pregnant at day 25. Thus fertilization failure and/or early embryonic death were more important in total failures of pregnancy that occurred before day 25 than in later losses. Overall, it is important to realize that ovulation rate is not the only factor limiting litter size in sheep.

CONCLUSIONS:

Treatment of ewes during the anestrous period with progesterone for as little as 5 days before ram introduction can result in synchronized fall lambing in greater than 65% of ewes treated, an improvement of 20 percentage points over

ram introduction alone. Treatment with FSH one (1) day before progesterone removal, will sometimes yield a small increase in litter size in ewes bred out-of-season, but only in flocks with naturally low ovulation rates, and FSH increased embryonic and fetal mortality. Therefore, general use of FSH cannot be recommended.

CIDR-G devices are now approved for use in the US sheep industry and marketed in this country, treatment with a CIDR device for 5 days before ram introduction can be used to induce out-of-season breeding. This regimen can allow producers to target lamb markets when prices are highest. Its utilization in the industry could help to ensure a consistent supply of lamb.

Treatment with a CIDR device for 5 days, with $PGF_{2\alpha}$ at device removal, can allow producers to plan lambing dates and concentrate labor at lambing time for ewes bred in season. However this use has not been approved for marketing in the US.

EXPERIENCE WITH USE OF CIDR-G IN 2010

Examples of results with CIDR-G inserts this past year are shown in Appendix Tables 1 and 2.

Authors:
Dr. Keith Inskeep is Professor. Dr. Marlon Knights is an Assistant Professor of Reproductive Physiology. Todd Ramboldt is a Graduate Research Assistant in Reproductive Physiology.

Appendix Table 1. Summary of pregnancy data for a flock of purebred Dorset ewes synchronized out-of-season with a 5-day CIDR-G followed by ram introduction – May and June 2010

Variable	CIDR
Total number of ewes	98
Percent ewes lambing, %	
First service period	54
Second service period	19
Third	4
Total	77
Prolificacy	
First service period	1.73
Second service period	1.82
Third service period	1.3
Overall	1.67
Sex of lamb	
Male	71 or 56%
Female	56 or 44%
Total potential lambs lost, %	19.5
Open at ultrasound, %	11

Appendix Table 2. Hair Sheep Flock - Some Selection for Fall Lambing – June 2010

Variable	Treatment 5-day CIDR+PGF
Total number of ewes	77
Percent ewes lambing	
First service period	47
Second service period	31
Third service period	13
Did not lamb	9
Prolificacy	
First service period	1.61
Second service period	1.38
Third service period	1.20
Overall	1.47
Sex ratio, %	
Male	50
Female	50
Chance for multiples, %	
Overall	
Single	56
Twins	41
Triplets	3
Multiples	44%

EAZI-BREED™
CIDR®
Sheep Insert

NET CONTENTS 20 EAZI-BREED CIDR Sheep Inserts per bag

Each EAZI-BREED CIDR Sheep Insert contains 0.30 grams of progesterone in molded silicone over a flexible nylon spine. Attached to each EAZI-BREED CIDR Sheep Insert is a polyester tail.

Caution: Federal law prohibits extra-label use of this drug to enhance food and/or fiber production in animals.

DRUG FACTS

Active Ingredient: Progesterone, 0.30 grams per EAZI-BREED CIDR Sheep Insert

Use:

- Induction of estrus in ewes (sheep) during seasonal anestrus

WARNINGS:

Human Warning: Avoid contact with skin by wearing latex gloves when handling the inserts. Keep this and all medications out of the reach of children.

Environmental Warning: Store removed EAZI-BREED CIDR Sheep Inserts in a plastic bag or other sealable container until they can be properly disposed in accordance with applicable local, state and Federal regulations.

Residue Warning:
A pre-slaughter withdrawal period is not required when this product is used according to label directions.

Do Not Use:

- in ewes with abnormal, immature or infected genital tracts
- in nulliparous ewe lambs
- an insert more than once. To prevent the potential transmission of venereal and blood borne diseases the EAZI-BREED CIDR Sheep Insert should be disposed after a single use.

This product is not approved for estrous synchronization during the breeding season?

When Using This Product:

- In ewes that respond to treatment the onset of estrus generally occurs within 1 to 3 days after removal of the EAZI-BREED CIDR Sheep Insert.

You May Notice:

- Clear, cloudy or bloody mucus on the outside of EAZI-BREED CIDR Sheep Insert when removed from ewes. The mucus may have an offensive odor. This is a result of mild irritation to the vaginal lining by the presence of the EAZI-BREED CIDR Sheep Insert, and generally clears between the time of removal and breeding. Such irritation does not affect fertility.

Directions:

For induction of estrus in ewes (sheep) during seasonal anestrus:

- Administer one EAZI-BREED CIDR Sheep Insert per ewe for 5 days.
- To optimize response to treatment, ewes should be exposed to mature rams during the 5 day administration period of the EAZI-BREED CIDR Sheep Insert.
- Used (removed) EAZI-BREED CIDR Sheep Inserts still contain some progesterone. Used EAZI-BREED CIDR Sheep Inserts must be stored in a sealable container until disposed. Sealed bag/container with used EAZI-BREED CIDR Sheep Inserts must be properly disposed in accordance with applicable local, state and Federal regulations.
- After insert removal, use standard flock breeding procedures to breed ewes on induced estrus. Make sure to have a sufficient number of rams to adequately breed all ewes in estrus. Breeds of rams may vary in libido in the non-breeding season. Therefore a ewe to ram ratio up to 18:1 is recommended for multi-sire situations. For single sire lots, 12:1 for ram lambs and up to 18:1 for yearling rams are recommended limits.

Insertion:

1. Avoid contact with skin by wearing latex gloves when handling inserts.

2. Only use the specially designed EAZI-BREED CIDR Sheep Insert Applicator for administration.

3. Restrain ewes appropriately (head catch, squeeze chute, gate, etc.) prior to administration.

4. Wash the EAZI-BREED CIDR Sheep Insert Applicator in a non-irritating antiseptic solution, and then lubricate the front portion of the EAZI-BREED CIDR Sheep Insert Applicator with a veterinary obstetrical lubricant.

5. Push the flexible tail end of the EAZI-BREED CIDR Sheep Insert into the EAZI-BREED CIDR Sheep Insert Applicator taking care to assure the tail is extending upward through the slot of the EAZI-BREED CIDR Sheep Insert Applicator and is pointed toward the handle.

6. Fold the wings of the EAZI-BREED CIDR Sheep Insert to make it longer and continue to advance the EAZI-BREED CIDR Sheep Insert into the applicator until it is fully seated. When fully seated only the tips of the wings should protrude (one half inch) from the end of the EAZI-BREED CIDR Sheep Insert Applicator (see Figure 1 below).

7. Lubricate the protruding tips of the wings of the EAZI-BREED CIDR Sheep Insert with veterinary obstetrical lubricant.

8. Clean the exterior of the vulva.

9. Open the lips of the vulva and gently place the loaded EAZI-BREED CIDR Sheep Insert Applicator through the vulva. The slot in the EAZI-BREED CIDR Sheep Insert Applicator should face upwards (see Figure 2 below).

10. Once the loaded EAZI-BREED CIDR Sheep Insert Applicator is past the vulva slope the EAZI-BREED CIDR Sheep Insert Applicator slightly upwards (35 - 45° angle) by lowering the handle, and then forward, without forcing, until the EAZI-BREED CIDR Sheep Insert Applicator is fully inserted or resistance is felt (see Figure 3 below).

11. Squeeze the finger grips within the handle of the EAZI-BREED CIDR Sheep Insert Applicator to deposit the EAZI-BREED CIDR Sheep Insert in the anterior vagina (see Figure 4 below) and then pull the EAZI-BREED CIDR Sheep Insert Applicator backwards to remove it from the vagina.

12. With the EAZI-BREED CIDR Sheep Insert correctly placed, with the wings open in the anterior portion of the vagina, the tail of the EAZI-BREED CIDR sheep Insert should be visible, pointing downward from the vulva of the ewe. Tails of EAZI-BREED CIDR Sheep Inserts that protrude more than 2.5 inches from the vulva may be clipped to minimize removal by other sheep.

Removal:

1. Remove EAZI-BREED CIDR Sheep Inserts by pulling, gently but firmly, on the protruding polyester tail.

2. EAZI-BREED CIDR Sheep Inserts may reverse direction within the vagina; therefore, if the polyester tail of the insert is not visible on the day of removal, check the vagina to determine if an insert is present.