HORMONAL RESIDUES OF SHEEP TISSUES ASSOCIATED WITH PROGESTERONE IMPLANT USED TO ENHANCED FEED EFFICIENCY AND WEIGHT GAIN

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INTRODUCTION

Exogenous hormone regimens have been developed for control of breeding in livestock (Boland et al., 1979; Ainsworth and Wolynetz,1982) and to improve feed efficiency of meat producing animals (Schanbacher, 1984; Basson et al.,1985).
Anabolic hormones have been widely used for above purposes. Melengestrol acetate (MGA) is an orally active progestogen which is applied to improve feed utilization and estrus suppression (Glimp and Cundiff, 1971). MGA was reported to have a larg and persistent residue (Neff,1983). Treatment with synthetic progesterone that is chemically identical to progesterone produced naturally may clear faster from the circulation and have a smaller and less persistent residue.
Solid silastic rubber progesterone implant is non-antigenic and permit the sustained release of uniform amounts of steriod compounds over long period of time (Dziuk and Cook, 1966; Hamra et al.,1986). Effects of subcutaneous progesterone implant on average daily gain and the possible residues in edible tissues of sheep have not been determined. This study was conducted to determine the effecte of subcutaneous progesterone implant on body weight gain and residues in the serum, liver, kidney, muscle and fat.

MATERIALS AND METHODS

Twenty Awassi ram lambs, 5 tO 6 months old and weighting 28.0±1.6kg were assigned randomly into two equal groups.One untreated group considered to be a control group. The second treated group recieved solid silastic progesterone implant containing 200 mg progesterone (pregn-4-ene-3,20 dione). Implant was 1 cm in diameter and 1 cm in length and inserted subcutaneously in the axillary region of a forelimb. Implants left in place for 10 weeks and removed 24 hrs before slaughtering. At time of slaughtering blood samples were taken to determine progesterone level and samples from liver, kidney muscle and fat were homogenized in an ice-cold 1.15% kcl and fractions were isolated by differential centrifugation as described by Heitzman et al. (1981) and Al-Bayati et al (1988). Progesterone concentrations were measured using a solis phase radioimmunoassay (Radio chemical center Amersham, Amersham, England).
Sensitivity of the assay was 0.1 ng/ml.
Lambs were fed a concentrate ration and roughage ad lib.
Data were analysed using T-test according to steel and Torrie (1960).

RESULTS

Effect of subcutaneous progesterone implant on average daily gain (ADG) is shown in table 1.

TABLE 1.Effect of progesterone implant on ADG.

	Untreated	Treated
No. of animals	10	10
Days of implantation	70	70
Initial weight, (kg)	29	27
Daily gain,(gm)	50	110

Lambs implanted with progesterone did improve significantly

(P<0.05) the ADG from 50 to 110 gm/day.

Subcutenous progesterone implant was an effective device to administer progesterone.

Previous studies have found that steriod implant can be used to enhance growth and perfo-rmance characteristics of steers (Brethour and Schanbacher, 1983; Brown, 1982) heifers (Henricks et al.,1982)and bulls (Kirk and Cooper,1983;Mckenzie, 1983).

Progesterone concentrations in serum of treated and untreated lambs were measured at time of slaughtering. Results showed that progesterone levels tend to be higher in serum of implanted lambs in comparison to control lambs. Differences were not significant. Progesterone values in serum were 0.1 ng/ml in treated lambs and below the sensitivity of the assay (<.1 ng/ml)in untreated lambs. This level of progesterone in treated lambs was expected within the range of progesterone release from the implant. Previous report (Hamra et al., 1986) have found that progesterone concentrations in plasma of ovariectomized ewes treated with subcutaneous solid silastic rubber progesterone implant increased to a peak value of 1.6 ng/ml by 24hrs after insertion then declined to 0.1 ng/ml on day 5 of treatment and remained at this level for the rest of treatment period.

Although progesterone concentrations were detected in serum of implanted lambs; the concentrations in kidneys,livers,muscles and fat were non-detectable, becouse progesterone values were below the sensitivity of the assay and residues were absent.

Therefore, no differences were obtained between implanted and unimplanted lambs in progesterone concentrations of tissues. However, Farber and Arcos (1983) reported that progesterone concentrations in muscle of steers treated with implants containing 200 mg progesterone in association with estrogen were in the order of 0.12 ng/gm. This value did not considered to be a residue that cause a hazard to human health. Endogenous production rate of progesterone in human was reproted in range of 150 mg/24hrs in prepubertal boys and 94,000 mg/24hrs in late pregnancy (Farber and Arcos, 1983). Thus, progesterone is not genotoxic and public safety can be met throught use it within recommended and approved limits.

Since the liver is known to be the major organ responsible for metabolism of steriod hormones including progesterone (Clark et al, 1977), residues of progesterone should be detected in this organ. Thus the non-detectable amount of progesterone in livers of treated animals support the a bove conclusion that residues were absent when animals were treated with progesterone that is chemically similar to endogenous progesterone and within the recommended levels.

CONCLUSION

The possible residues followed by exogenous hormonal treatment will be present in edible products of treated animals. Thus, possible human hazard from residues of these compounds in diet should be in concern. We have examined in this study the effectivness of subcutaneous progesterone implants on body weight gain and their possible residues in edible tissues.

Result showed that treatment with prosesterone implants increased body weight gain and did not leave residues that

are harmful to human health.

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