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Effects of Ractopamine (Optaflexx) Fed in Combination with Melengestrol Acetate on Feedlot Heifer Performance[1]

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ABSTRACT

Two commercial feedlot experiments were conducted to determine the effects of feeding melengestrol acetate (MGA) or MGA plus ractopamine (MGA+OPT) on the performance and carcass characteristics of finishing heifers. In Nebraska (Exp. 1), 1,807 heifers (337.3 ± 20.0 kg) and in Texas (Exp. 2), 1,964 heifers (331.5 ± 6.1 kg) were fed 0.4 mg of MGA daily. For heifers fed MGA+OPT, 200 mg of ractopamine was fed daily the last 29 (Exp. 2) or 36 d (Exp. 1). Live and carcass-adjusted performance data were collected. On a carcass-adjusted basis, G:F for the entire feeding period was improved (P < 0.01) by 1.7 and 3.7% in Exp. 1 and 2, respectively, for heifers fed MGA+OPT compared with MGA. For the last 29 to 36 d, G:F was increased (P < 0.02) by 8.1% (Exp. 1) or 27.2% (Exp. 2) on a carcass-adjusted basis for heifers fed MGA+OPT compared with MGA. Fat thickness, USDA YG, marbling score, LM area, and percentage USDA Choice were not different (P > 0.47) between treatments in Exp. 1. Carcasses from heifers fed MGA+OPT had decreased marbling scores (P = 0.01) and greater LM area (P = 0.01) than carcasses from heifers fed MGA in Exp. 2. In Exp. 1, in which G:F was improved by 8.1%, no effect on QG was observed. In Exp. 2, in which G:F was improved by 27.2%, QG decreased. Based on these results, feeding MGA+OPT increased ADG and improved G:F, with variable effects on carcass characteristics.

Key words: feedlot cattle, heifer, melengestrol acetate, Optaflexx, ractopamine

INTRODUCTION

Melengestrol acetate (Pfizer Animal Health, New York City, NY) is an easily administered, orally active progestogen that has been shown to increase BW gain and improve feed efficiency when compared with heifers that did not receive melengestrol acetate during the finishing period (Bloss et al., 1966; Lauderdale, 1983; Kreikemeier and Mader, 2004). Feeding melengestrol acetate inhibits estrus and ovulation and is a product commonly fed daily to finishing heifers at an inclusion level of 0.25 to 0.50 mg/heifer. Carcass weights are the ultimate weight measure for determining the final value of a beef animal (Owens et al., 1993). β-Adrenergic agonists have been shown to cause changes in growth with increased accretion of skeletal muscle and decreased accretion of fat (Mersmann, 1998). Optaflexx (Elanco Animal Health, Greenfield, IN), the trade name for ractopamine-HCl, is a β-1 adrenergic agonist. When Optaflexx was fed to heifers the last 28 to 42 d of the finishing period, heifers had increased weight gain on both a carcass-adjusted and BW basis, improved feed efficiency, and no change in marbling when fed at a rate of 10.0, 20.0, or 30.0 g/ton (Schroeder et al., 2003b). The increased BW and carcass weight were 7.2 and 2.9 kg, respectively, for heifers fed 200 mg/heifer daily. The BW response to feeding Optaflexx to heifers is less than the response in steers (Schroeder et al., 2003a,b; Laudert et al., 2004). These previous studies were completed before MGA was cleared to be fed with Optaflexx; therefore, diets did not include melengestrol acetate, nor

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did heifers receive implants containing trenbelone acetate. The objective of these experiments was to determine the effect of feeding Optaflexx in combination with melengestrol acetate on finishing heifer performance and carcass merit.

MATERIALS AND METHODS

Experiment 1

The experiment was conducted at a commercial feedlot in central Nebraska between August 2004 and March 2005 using 1,807 British × Continental heifers (337.3 kg ± 20.0) fed in 20 pens (10 pens/treatment). After arrival, heifers were individually weighed, processed, and blocked by date received and site of procurement. Therefore, within each replication, cattle were received on the same day and from the same point of origin in a balanced fashion. During initial processing, heifers were vaccinated for viral diseases (BoviShield Gold 4, Pfizer Animal Health), treated for internal and external parasites (Dectomax Injectable, Pfizer Animal Health), and implanted with Ralgro (Schering-Plough Animal Health, Union, NJ). Heifers were determined to be bred, open, or freemartins by rectal palpation. Freemartins and heifers more than 100 d pregnant were removed from the trial. Heifers less than 100 d pregnant were given a single 5-mL injection of Lutalyse (Pfizer Animal Health). Heifers diagnosed as open were not injected with Lutalyse. Therefore, if heifers were very early in pregnancy and unable to be identified as pregnant via rectal palpation, those heifers remained on trial. Heifers from separate locations were assigned randomly using processing order and by sorting every other heifer through the chute to 1 of 2 treatments. Heifers were then assigned randomly to their home pen (10 replications/treatment) with an average of 90 heifers/pen (range 60 to 145 heifers/pen). Treatments were 1) heifers fed melengestrol acetate for the entire finishing period (**MGA**), and 2) heifers fed melengestrol acetate for the entire finishing period and Optaflexx the last 31 to 38 d (**MGA+OPT**). Within each replication, heifers were monitored the same number of days during Optaflexx feeding in a balanced manner. Once initially processed, heifers were adapted to high-grain finishing diets; however, melengestrol acetate was not included during grain adaptation. The finishing diet was formulated to provide 0.4 mg/heifer of melengestrol acetate, 330 mg/heifer of Rumensin (Elanco Animal Health), and 90 mg/heifer of Tylan (Elanco Animal Health) daily. During the last 31 to 38 d of finishing (average of 35.5 across all 10 replications), Optaflexx was included in the diet to achieve a daily intake of 200 mg/heifer for heifers fed the MGA+OPT treatment.

Heifers were reimplanted with Synovex Plus (Fort Dodge Animal Health, Overland Park, KS) an average of 80 d preslaughter (range 73 to 87 d), with animals implanted on the same day within arrival block. The final diet contained 38% dry-rolled corn, 29.5% steam-flaked corn, 18% wet distillers grains plus solubles, 6% alfalfa hay, 2% sorghum hay, 1.5% fat, and 5% supplement in the control diet (DM basis). The MGA+OPT supplement was delivered in a pelleted form fed at 4% of the dietary DM to replace dry-rolled corn. The Optaflexx supplement consisted of finely ground corn and wheat middlings. Diet samples were taken once a month and analyzed at a commercial laboratory. The finishing diet contained 14.9% CP, 0.72% Ca, 0.37% P, and 6.9% fat (DM basis). Heifers were fed an average of 133 d (range of 126 to 143 d balanced within each replication). Feed intake was calculated by using the amount of feed delivered to the bunk of each individual pen of cattle and corrected for DM of ingredients.

Performance was summarized on both a live BW basis as well as a carcass-adjusted basis. For live BW performance, pen BW were taken for each pen at initial processing, reimplantation, the beginning of Optaflexx feeding, and before shipment on the day of slaughter. Pen weights were shrunk 4%. Initial pen BW were not shrunk because animals were processed immediately upon arrival or after an overnight receiving period. Pen weights were used for performance calculations on a live BW basis. Carcass weights were adjusted to a common dressing percentage of 63.5% to calculate a carcass-adjusted final BW. The constant dressing percentage of 63.5% was used in both experiments to reduce the variation in BW measures that can occur from factors such as gut fill (MacDonald et al., 2007). Carcass-adjusted final BW was used to determine ADG and G:F on a carcass-adjusted basis.

Both pens within a block (replication) were harvested under similar conditions on the same day at the same plant. Hot carcass weights (**HCW**) and liver abscesses were recorded on the day of slaughter. Carcass fat thickness, USDA called marbling score, KPH, LM area, and USDA YG were recorded after a 24- to 36-h chill. Yield grade was calculated as 2.5 + (6.35 × fat thickness, cm) + (0.0017 × HCW, kg) + (0.2 × KPH, %) − (2.06 × LM area, cm^2), from Boggs and Merkel (1993). Empty body fat was calculated as 17.76207 + (4.68142 × rib fat thickness, cm) + (0.01945 × HCW, kg) + (0.81855× marbling/100) − (0.06754 × LM area, cm^2), from (Guiroy et al., 2002).

Experiment 2

This experiment was conducted at a commercial feedlot located in the Texas Panhandle between October 2004 and February 2005 using 1,964 (331.5 kg ± 6.1) British × Continental heifers fed in 20 pens (10 pens/treatment). After arrival, heifers were individually weighed, processed, and blocked by date received and site of procurement. During initial processing, heifers were vaccinated for viral diseases (BoviShield Gold 4 and Fortress 7, Pfizer Animal Health), treated for internal and external parasites (Dectomax Injectable, Pfizer Animal Health), and given a single Revalor H implant (Intervet Inc., Millsboro, DE) at arrival. Heifers were determined to