

FATTENING PERFORMANCE AND CARCASS CHARACTERISTICS OF GERMAN RED PIED BULLS

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SUMMARY

It was target that the weight of final of German Red Pied bulls imported from Germany should be 550 kg in the first group , 600 kg in the second group and 650 kg in the third group in the semi-open barn with a small yard (loose housing) conditions.

During the research , it wasn't seen any negative sign besides foot disease in one bull.

In the different final weights of the first , second and third groups, it was found that during the fattening the average daily live weight gain were 1.42 ,1.30 and 1.33 kg, the feed efficiency were 7.85 ,8.55 and 8.59 kg/kg gain and cold dressing percentage was 54.86 % , 56.17 % and 55.56 % , respectively.

The slaughtering and carcass characteristics increased while the final weights did . It was concluded that the optimum weight at final would be 600-650 kg.

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When the research has been completely considered, it has been seen that German Red Pied breed can be successfully used as beef cattle in Turkey.

Key words: German Red Pied, fattening performance, carcass traits.

ÖZET

Alman Kırmızı Alaca Danaların Besi Performansı ve Karkas Özellikleri

Almanya'dan ithal edilen Alman Kırmızı Alaca erkek danaların yarı-açık ahır şartlarında kesim ağırlıkları I. grupta 550 kg, II. grupta 600 kg, III. grupta 650 kg hedeflenmiştir.

Araştırma süresince bir hayvanın ayak hastalığı dışında hiç bir uyumsuzluk gözlenmemiştir.

Farklı kesim ağırlıklarındaki I., II. ve III. gruplarda besi süresince günlük ortalama canlı ağırlık artışı sırasıyla 1.42, 1.30 ve 1.33 kg; 1 kg ağırlık artışı için tüketilen yem kuru madde miktarı 7.85, 8.55 ve 8.59 kg ve soğuk karkas randımanı % 54.86, % 56.17 ve % 55.56 bulunmuştur.

Kesim ağırlığı arttıkça, kesim ve karkas özellikleri de artmıştır. Optimum kesim ağırlığının 600-650 kg olabileceği ortaya çıkmıştır.

Araştırma bütünüyle değerlendirildiğinde, Alman Kırmızı Alaca ırkının Türkiye'de başarıyla besi hayvanı olarak kullanılabileceği görülmüştür.

Anahtar Kelimeler: Alman Kırmızı Alaca, Besi Performansı, Karkas Özellikleri.

INTRODUCTION

The investigation of the ability of adaptation and the yield of performances of the imported animals for pure breeding and improving of the animals in a country was important from the point of directing to breeding⁹. If these kinds of studies were carried out on the imported animals, first of all the problem of these animals health wouldn't appear and also we would gain their real production.

The aim of this study was to investigate the fattening performances and carcass characteristics of German Red Pied bulls imported to Turkey, in the semi-open barn with small yard conditions.

In Germany, in two different investigations where the fattening performances of the German Black Pied and German Red Pied bulls were compared, it was found that during the fattening (from 70 to 450 kg) daily live weight gain was 1101-1103 g and 1113 - 1135 g and dressing percentage 54.85% and 56.17 %, respectively^{1,2}.

It was established that average daily live weight gain of Limousin, Charolais and Aberdeen Angus bulls fattened for 120 day from 6 months of age was 1152 , 1319 and 1089 g respectively³.

In German Red Pied , Holstein Friesian X German Red Pied (F₁) and F₁ X German Red Pied crosses bulls which were fattened in 8 or 9 months of age and in 192-217 kg live weight , Zieminski and et all¹² pointed out that the daily live weight gain during the fattening was 942.7, 1010.2 and 862 g, dressing percentage 55.96 % , 53.48 % and 57.74 % respectively.

It had been found that the seperable fat percentage was 2.41% and the percentage of meat in carcass was 82.41 % in the final weight (538.9 kg) of German Red Pied bulls⁶. Langbehn and Raue⁸ had established that final weight was 570.6 kg, daily live weight gain was 858 g, dressing percentage was 57.4 % , the weight of kidney fat was 11.3 kg and feed efficiency was 4.38 kg/kg gain of German Red Pied bulls.

The bone percentage of German Red Pied bulls (300 kg carcass weight) was found 18.1 % in intensive feeding conditions to 485 days of age¹⁰.

In the study where the carcass characteristics and fattening performance of Brown Swiss bulls in 6-8 month of age in semi-open with small yard conditions were investigated, the bulls had been slaughtered in 400, 450 and 500 kg live weight. The daily live weight of the bulls slaughtered in the three slaughter weight was found 1207, 1225 and 1207 g, feed efficiency was 7.19, 7.69 and 8.25 kg/kg gain and bone percentage was 16.9 % , 16.4 % and 15.5 % , respectively⁴. In the same study the increasing in the values of the dressing percentage, the characteristics of slaughtering and carcass were realised the final weight increased.

Koçak and et all⁷ had found that daily live weight gain of Holstein bulls which were fattened with the concentrates including energy in different levels and whose initial weights were 334.8, 348.8 and 358.2 kg was 1.26, 1.22 and 1.25 kg., feed efficiency was 9.3, 9.4 and 11.2 kg/kg gain, dressing percentage was 54.5 % , 55.9 % and 57.3 % and bone percentage was 17.56 % , 18.48 % and 16.40 % respectively.

MATERIALS and METHODS

The materials of this study were formed with German Red Pied bulls 12-13 month of age imported from Germany.

This study was carried out in the semi-open barn with a small yard (loose housing) conditions in Center of Research and Application, the Faculty of Veterinary Medicine, University of Uludag. The 30 head German Red Pied bulls used in this study were allocated into three groups by considering their live weights and each group consisted of 10 animals. Their final weights

in the first, second and third group were aimed at 550 kg , 600 kg and 650 kg, respectively

The animals in each group were kept and managed in the small yards (6 x 14 m²) according to free system of rounding. The group feeding was applied to the animals and they were given possibility of drinking water whenever they want.

During the fattening, the concentrate diet containing 14.0 % crude protein and 2556 Kcal/kg metabolic energy and straw were used.

The fattening began just after fifteen days feeding exercise period. At the beginning of the fattening and during the experiment, the animals were weighed every two weeks to get their live weight . The weights of the animals were determined in the morning after they hadn't been fed and watered in twelve hours. By using the values of these weighing, the level of the daily live weight gain was investigated and on the other hand, the need of daily feed of the groups was calculated. In this calculating, dry matter of feed as 3 % of group live weight was taken into consideration. The concentrate diet was given in the morning and evening, but the straw was always given to the animals. The amount of straw daily given to the groups was recorded.

Before the animals reaching the aimed final weight weren't slaughtered, they were weighed to get their final weight after 12 hour hunger and thirst.

During the slaughter, the weights of hide, head, feet, testis, penis, tail, heart, lung, liver, spleen, Rumen-Reticulum-Omasus-Abomasus (empty), small-large intestine (empty), internal fat, kidneys and kidney fat were determined.

The carcass characteristics of the five animals taken at randomly from each group were investigated. Just after the slaughtering the warm carcass weights were taken and cold carcass weight was taken after the warm carcass was waited at 4°C for 24 hours. After the dissecting of right side of carcass, the amount of bone, first quality cuts (Tenderloin, Rib chops, Beef loin, Sirloin tip, Bottom round, Eye of round, Top round and Top sirloin) and meat for mince and gobbets was the determined⁵. By multiplying the data taken from the dissecting of the half carcass by two, the values of the whole carcass was found for each characteristics. While the statistical values of the data were appreciated, in the multiple comparisons of group, "variance analysis" and "Kruskal-Wallis analysis" but their special comparisons "Tukey-Dunn's test" were applied¹¹.

RESULTS

During the research, it wasn't seen any diseases and adaptation problem in the animals but only in one animal a foot disease was seen.

1. Fattening Performance:

The findings about the fattening performance of German Red Pied bulls were given in table I.

Table: I
Findings About Fattening Performance in Different Final Weights

CHARACTERISTICS	Group I (n=10)		Group II (n=10)		Group III (n=10)		F
	\bar{x}	S \bar{x}	\bar{x}	S \bar{x}	\bar{x}	S \bar{x}	
Initial weight (kg)	324.05	10.78	324.55	10.72	325.95	8.37	0.01
Final weight (kg)	550.20	1.57	603.50	1.96	650.70	2.55	-
Gain (kg)	226.15	11.43	278.55	10.38	324.75	7.95	-
Fattening Period (day)	164.70	12.32	215.20	7.85	246.20	10.49	-
Daily gain (kg/day)	1.42	0.09	1.30	0.04	1.33	0.04	1.04
Feed efficiency (kg/kg gain)	7.85	0.50	8.55	0.25	8.59	0.29	1.34

As seen in the Table I, fattening period, daily live weight gain and feed efficiency were 164.7 days, 1.42 kg and 7.85 kg/kg gain in the first group, 215.2 days, 1.30 kg and 8.55 kg/kg gain in the second group and 246.2 days 1.33 kg and 8.59 kg/kg gain in the third group, respectively.

It wasn't found any statistically significant between the groups from the point of daily live weight and feed efficiency.

2. Slaughtering Characteristics:

The average values of slaughtering characteristics were given in the table II.

Table: II
Slaughtering Characteristics in the Different Final Weights

CHARACTERISTICS	Group I (n=10)		Group II (n=10)		Group III (n=10)		F
	\bar{x}	S \bar{x}	\bar{x}	S \bar{x}	\bar{x}	S \bar{x}	
Final weight (kg)	550.20	1.57	603.50	1.96	650.70	2.55	-
Hide (kg)	46.65	1.03 ^a	48.70	0.87 ^{ab}	51.80	0.74 ^b	8.52 ^{***}
Head (kg)	17.82	0.29 ^a	19.74	0.34 ^b	21.00	0.31 ^c	26.01 ^{***}
Feet (kg)	9.52	0.21 ^a	10.16	0.17 ^{bc}	10.59	0.13 ^c	9.65 ^{***}
Testis (g)	930.00	51.73	990.00	58.60	950.00	40.12	0.36
Penis (g)	980.00	44.21	1080.00	59.26	1040.00	61.82	0.82
Tail (kg)	1.39	0.07	1.45	0.13	1.66	0.09	2.04
Heart (kg)	2.37	0.06 ^a	2.81	0.06 ^b	2.91	0.10 ^b	14.87 ^{***}
Lung (kg)	10.37	0.31	9.83	0.76	11.10	0.40	1.48
Liver (kg)	8.13	0.19	8.71	0.42	8.80	0.35	1.18
Spleen (kg)	1.13	0.05	1.19	0.08	1.19	0.12	0.16
Rumen-Reticulum-Omasus - Abomasus "empty" (kg)	21.09	1.12	20.49	0.72	21.57	0.67	0.40
Large intestine "empty" (kg)	10.00	0.25 ^a	11.55	0.48 ^{ab}	12.18	0.73 ^b	4.60 [*]
Small intestine "empty" (kg)	6.05	0.14	6.28	0.20	6.44	0.39	0.53
Internal fat (kg)	5.47	0.60	6.29	0.56	7.84	0.92	2.87
Kidneys (kg)	1.39	0.05	1.49	0.08	1.51	0.07	0.85
Kidney fat (kg)	5.76	0.50	6.78	0.77	6.23	0.51	0.71

* : P < 0.05

*** : P < 0.001

a - c : The differences between the group averages carrying the various letters in the same row are important (P < 0.05).

The whole slaughtering characteristics increased as the parallel of the final weight (Table: II). The weight differences of hide, head, feet, heart and large intestine (empty) between the groups were found as statistically significant ($P < 0.05$, $P < 0.001$).

In the first, second and third experiment groups seperable fat percentage was found as 2.04 %, 2.17 % and 2.16 %, respectively.

3. Carcass Characteristics:

The findings about the carcass characteristics were given in Table III.

Table: III
Carcass Characteristics in Different Final Weights

CHARACTERISTICS	Group I (n=5)		Group II (n=5)		Group III (n=5)		F
	\bar{x}	S \bar{x}	\bar{x}	S \bar{x}	\bar{x}	S \bar{x}	
Final weight (kg)	550.20	1.46	602.80	5.67	655.20	4.03	-
Warm carcass weight (kg)	306.60	7.86	343.80	7.21	368.40	3.65	11.52**
Warm dressing percentage (%)	55.72	1.34	57.03	1.03	56.24	0.69	0.86
Cold carcass weight (kg)	301.89	8.26*	338.63	7.68 ^{ab}	364.00	3.83 ^b	11.06**
Cold dressing Percentage (%)	54.86	1.41	56.17	1.15	55.56	0.76	0.86
Bone weight (kg)	46.68	1.80*	54.32	1.89 ^{ab}	56.45	1.30 ^b	7.76*
Bone Percentage (%)	15.47	0.47	16.05	0.51	15.51	0.34	0.26
First quality cuts (kg)	73.30	3.23*	80.95	1.97 ^b	86.08	1.47 ^b	9.92**
Tenderloin (kg)	3.81	0.18*	4.38	0.12 ^{ab}	4.51	0.15 ^b	7.66*
Rib chops (kg)	9.70	1.07	10.66	0.54	11.93	0.58	2.72
Beef loin (kg)	5.90	0.49*	6.86	0.19 ^{ab}	8.29	0.38 ^b	8.24*
Sirloin tip (kg)	9.90	0.27*	11.50	0.28 ^b	11.33	0.50 ^{ab}	7.44*
Bottom round (kg)	12.62	0.79*	14.09	0.40 ^{ab}	15.07	0.38 ^b	6.14*
Eye of round (kg)	5.02	0.35	5.56	0.28	5.66	0.17	1.55
Top round (kg)	16.39	0.69	17.38	0.77	18.24	0.43	4.66
Top sirloin (kg)	9.98	0.48	10.51	0.19	11.05	0.37	2.35
Meat for mince (kg)	118.88	4.13*	35.28	6.38 ^{ab}	151.52	6.53 ^b	7.22*
Gobbets (kg)	52.21	5.13	59.45	4.01	58.00	7.76	1.09

* : $P < 0.05$

** : $P < 0.001$

a - c : The differences between the group averages carrying the various letters in the same row are important ($P < 0.05$).

While carcass weight increased, the amount of first quality meat increased. The differences in the amount of first quality meat of second and third groups between of the first group were found as statistically significant ($P < 0.01$). The differences of warm-cold dressing percentage and bone percentage between the groups weren't found as statistically significant. The percentage of meat in the carcass of the first, second and third experiment groups was found as 80.95 %, 81.41% and 81.20 %, respectively.

DISCUSSION

In this study, the average daily live weight gain in each three experiment groups was similar those of Aberdeen Angus bulls³, but higher values of the German Red Pied and the other breeds^{1,2,3,4,7,8,12}.

It had been found that the feed consumption was low for Holstein⁷, similar for Brown Swiss⁴ and high for German Red Pied bulls⁸.

That the feed consumption for German Red Pied bulls in this study was found higher than the feed consumption for the same breed in another study might be derived from rational differences.

The increasing of characteristics of carcass and slaughtering as the parallel of the increasing of carcass and slaughtering weights was similar to the results given for the Brown Swiss bulls⁴. In this study cold dressing percentage (54.86 %, 56.17 % and 55.56 %) found in the groups was similar those of German Red Pied and the other breed bulls^{2,7,8,12}.

In this study the percentage of seperable fat and meat in the carcass was seen at the similar level with the values given in another study on German Red Pied bulls⁶. The bone percentage of German Red Pied and the other breed bulls^{4,7,10} was found higher than those in this study. It was concluded that the optimum weight at slaughter would be 600-650 kg.

When the research is completely considered, it was concluded that German Red Pied bulls can be successfully used as fattening animals in Turkey.

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