Cattle fattening practices and performances in urban and peri-urban areas of Dangila town of Awi Zone, Amhara Region, Ethiopia

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Cattle fattening practices and performances in urban and peri-urban areas of Dangila town of Awi Zone, Amhara Region, Ethiopia

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Abstract: The study was conducted in Dangila town, Ethiopia, to assess the cattle fattening practices and fattening performances of cattle in the area. A semi-structured questionnaire survey and on-farm monitoring of fattening cattle were carried out. A total of 200 cattle fatteners (160 from peri-urban and 40 fatteners urban) were included in the survey. Fattening was monitored for weight change. The initial, the middle, and final body weights were taken using a heart girth meter. The survey data was analyzed and summarized using descriptive statistics and index ranking. Monitoring data was analyzed using the General Linear Model Procedure of SPSS. The mean family size, age of household heads, and landholding were 5.15, 38.04 years, and 0.2 hectares, respectively. Respondents had average fattening experiences of 4.36 ± 3.03 years and fatten 2.24 ± 2.74 cattle per cycle. Body size/frame (index = 0.485) and the health condition of animals (index = 0.162) were the first and second selection criteria to purchase fattening animals. Crop residue (index = 0.26) and agro-industrial by-products (index = 0.33) were the first used feedstuffs in the peri-urban and urban systems, respectively. The mean final body weight of fattening animals was 365.443 ± 1.51 kg with a mean fattening duration of 107.38 ± 0.58 days. Feed shortage was the first challenge that fattening...
households are facing in the peri-urban (index = 0.331) and urban areas (index = 0.290) of Dangila district. The result indicated that cattle fatteners should get the proper advice on animal selection and duration of fattening, feeding, and accessibility to credit service.

**Subjects: Agriculture and Food; Animal Physiology; Meat & Poultry**

**Keywords:** cattle fattening practices; Dangila district; peri-urban and urban cattle fattening

1. **Introduction**

Ethiopia has the largest livestock population in Africa that has been contributing a considerable portion to the economy of the country and still promising potential for the economic development of the country. A study by Behnke and Metaferia (2011) indicated that the livestock sector contributes about 47% to the Agricultural Gross Domestic Product (AGDP), including monetary values and non-marketed services (traction and manure) in Ethiopia. Hence, livestock remains a pillar for food security, human nutrition, and the economic growth of the country (Shapiro et al., 2015).

In developing countries including Ethiopia, demand for human foods of animal origin is increasing from time to time due to human population growth, rise in income, and urbanization (Thornton, 2010) which could be seen as an opportunity to benefit from the livestock sector. However, the contribution of the Ethiopian livestock resource to human nutrition and export earning of the country is disproportionately low due to the poor productivity of the animals as compared to the regional and continental average (Behnke & Metaferia, 2011). This is mainly due to the low quality and insufficient feed supply (Gebremedhin et al., 2007).

Nowadays, cattle fattening is becoming an important livestock farming activity especially in urban and peri-urban areas of the country (Halala, 2015). There are large numbers of smallholder farmers engaged in livestock fattening activities (Woldu, 2004). The growing population, urbanization, and economic growth are contributing to the growing demand for livestock, and livestock products particularly meat is one of the main products from cattle fattening in Ethiopia (Halala, 2015).

However, the potential of cattle fattening in these systems has not been fully utilized for several reasons including a lack of appropriate information and inputs. Understanding the system could help devise possible solutions and ways. In this regard, several research activities have been carried out elsewhere in Ethiopia (Abebe & Urge, 2014; Ahmed et al., 2016, 2017). However, the system is variable based on the resources available like feeds and feeding, the breeds, market accessibility. The urban and peri-urban beef cattle production system is immerging recently (FAO, 2019). Therefore, it is essential to generate information regarding urban and peri-urban cattle fattening practices and evaluate the fattening performance of local cattle types for a specific locality. This study was, therefore, conducted to assess the cattle fattening practices, describe the potential and challenge of the sector, and evaluate the fattening performances of the animals by small-scale cattle fatteners in and around Dangila town.

2. **Materials and methods**

2.1. **Description of the study area**

The study was conducted in Dangila district that is found in Awi administrative zone of the Amhara National Regional State (Figure 1). Dangila is located along the main road from Addis Ababa to Bahir Dar about 485 km northwest of Addis Ababa (country capital) and 78 km from Bahir Dar, the regional capital (DTAADO, 2018, unpublished). Geographically, the area is located between 11° 18'
N latitude and 36° 57' E longitudes and it lies at an altitude of 2200 m a.s.l. The mean annual rainfall and temperature are 1576 mm and 17°C, respectively (DTAADO, 2018, unpublished).

The major crops that grow in Dangila district are maize, teff, wheat, millet, and potatoes (DTAADO, 2018, unpublished). According to Dangila town Agriculture and Development Office (2018), the annual report indicates that it has total livestock population of 162,877 cattle, 71,996 sheep and goats, 15,032 Equines, 115,144 chicken, and 14,350 bee colonies.

2.2. Sampling procedure and sample size
The sampling frame in this study was designed based on households who are currently fattening at least one cattle. Hence, all the registered urban fatteners were sampled using a complete enumeration technique since the number of urban fatteners was manageable. For the peri-urban fatteners, a random sampling technique was applied due to the presence of a large number of cattle fatteners. As a result, in peri-urban kebeles, the sample size (n) was determined using the formula recommended by Yamane (1967),

\[ n = \frac{N}{1 + Ne^2} \]

where: \( n \) = the sample size, \( N \) = the population size, and \( e \) = the level of precision. Accordingly, a total of 200 cattle fatteners (40 urban and 160 peri-urban) were selected and interviewed.

2.3. Data source and data collection method
The survey data were collected from both primary and secondary data sources. A semi-structured survey questionnaire was used to collect data on household characteristics, type, and breeds of fattening cattle, feeding, and management aspects of fattening cattle. A monitoring activity was carried out to collect data on the weight change of fattening cattle. Body weight was taken at the beginning, in the middle of the fattening activity, and finally at the end before the animals were sold out. A heart girth meter was used for weight measurement. The heart girth was measured
after overnight fasting early in the morning before feeding. Average daily weight gain (ADWG) was calculated from initial and final body weight as:

\[
\text{ADWG} = \frac{\text{FBW} - \text{IBW}}{\text{Totalfatteningdays}}, \text{ where: FBW—Final body weight; IBW—initial body weight.}
\]

2.4. Data management and statistical data analysis

All collected survey data were coded and entered into a database using Statistical Package for Social Science for Windows version 20 (SPSS, 2011). Descriptive statistics such as frequency, percentage, range, standard deviation, and means were used to present the result. Data on IBW, FBW, and ADWG were analyzed using the General Linear Model Procedure of Statistical Package for Social Science (SPSS 20) (SPSS, 2000). Production systems (urban and peri-urban) and weight groups (small, medium, large) were used as fixed effects. Weight groups were categorized based on initial body weight as Small (Mean±SD); Medium (Mean±SD); and Large (Mean±SD).

The model used for the analysis was:

\[
Y_{ij} = \mu + P_i + W_j + \epsilon_{ij}
\]

Where: \(Y_{ij}\) = Response variables (IBW, FBW, and ADWG)

\(\mu\) = Overall mean

\(P_i\) = the effect of the \(i^{th}\) production system effect (2 = Peri-urban, Urban)

\(W_j\) = the effect of the \(j^{th}\) weight group (3 = small, medium, large)

\(\epsilon_{ij}\) = random error

An index was also calculated to provide a ranking of the major feed resources, beef cattle selection criteria, and beef cattle fattening constraints using a rank index formula based on the method by Musa et al. (2006).

\[
\text{Rank index} = \frac{\sum \text{Value of the least ranked constraint} \times \text{Counted value of the least ranked level}}{\text{Rank index} = \sum \text{Value of the least ranked level}}
\]

Where: \(R_n\) = Value of the least rank of constraint; \(C_n\) = Counted value of the least ranked level, \((R_n \times C_n)\) = \(\sum\) = weighted summation of each constraints.

3. Result and discussion

3.1. Household characteristics

The mean family size and age of the households in the study area are shown in Table 1. The average family size per household \((5.15 \pm 1.41)\) was significantly \((p < 0.001)\) higher in peri-urban than in the urban production system \((3.83 \pm 1.32 \text{ vs. } 5.49 \pm 1.23)\). Higher family size in the peri-urban area could be an opportunity in relation to labor for cattle fattening practices. The overall family size in this study area was comparable with other reports by Ahmed et al. (2016) in Dessie and Kombolcha town. The mean age of household heads was 38.04 ± 8.01 years to which there was no difference between fattening systems (Table 1).

The mean cattle fattening experiences of respondent farmers were 4.36 ± 3.03 years to which fatteners in the peri-urban area had longer \((4.63 \pm 3.17 \text{ years})\) experience of fattening cattle than the urban ones \((3.3 \pm 2.08 \text{ years})\) (Table 1). This indicates that cattle fattening in the study area is a newly emerging agricultural activity and at its infant stage.

Most of the households in the study area completed their primary school \((42.0\%)\) followed by those who completed high school \((23.0\%)\), Table 2. The educational level of the cattle fattener
## Table 1. Socio-economic characteristics of cattle fattening households in the urban and peri-urban districts of Dangila district

| Parameters                  | Fattening system (mean ± SD) |                      |                      |                      | p-value |
|-----------------------------|-----------------------------|----------------------|----------------------|----------------------|---------|
|                             | Peri-urban (N = 160)        | Urban (N = 40)       | Overall (N = 200)    |                      |         |
|                             | Mean±SD                     | Mean±SD              | Mean±SD              |                      |         |
|                             | Range                       | Range                | Range                |                      |         |
| Family size                 | 5.49 ± 1.23                 | 3.83 ± 1.32          | 5.15 ± 1.41          | 0.001                |
| Age of HHs heads            | 38.5 ± 8.3                  | 36.3 ± 6.61          | 38.04 ± 8.01         | 0.12                 |
| Fattening Experience (years)| 4.63 ± 3.17                 | 3.3 ± 2.08           | 4.36 ± 3.03          | 0.013                |
| Number of fattened cattle/cycle | 1.71 ± 0.88               | 4.35 ± 5.45          | 2.24 ± 2.74          | 0.001                |

Notes: N = number of respondents, SD = Standard deviation, HHs = household.
households could have positive implications in identifying and determining the type of development and extension service approaches. Ahmed et al. (2017), described a similar level of education for the HH heads who participated in cattle fattening practices in Dessie and Kombolcha town.

The major household income in the study area was identified as crop and livestock production (78.5%), small-scale trade (19%), and livestock production (2.5%), Table 2. This result was in agreement with the finding of Tadesse (2018) who reported that the major sources of household income (96.3%) were from crop and livestock production in West Hararghe Zone.

### Table 2. Educational level and major income sources of cattle fattening households in the urban and peri-urban areas of Dangila district

| Parameters                        | Peri-urban N = 160 | Urban N = 40 | Overall N = 200 |
|-----------------------------------|--------------------|-------------|-----------------|
|                                   | Freq. | %         | Freq. | %         | Freq. | %         |
| Educational status                |       |           |       |           |       |           |
| Illiterate                        | 17    | 10.6      | 3     | 7.5       | 20    | 10.0      |
| Read and write                    | 39    | 24.4      | 4     | 10.0      | 43    | 21.5      |
| Grade 1–8                         | 68    | 42.5      | 16    | 40.0      | 84    | 42.0      |
| Grade 9–12                        | 36    | 22.5      | 10    | 25.0      | 46    | 23.0      |
| Certificate and above             | 0     | 0         | 7     | 17.5      | 7     | 3.5       |
| HH income source of respondents   |       |           |       |           |       |           |
| Crop and livestock production     | 157   | 98.13     | 0     | 0.00      | 157   | 78.5      |
| Livestock production              | 0     | 0.00      | 5     | 12.5      | 5     | 2.5       |
| Small scale trade                 | 3     | 1.87      | 35    | 87.5      | 38    | 19        |

Note: N = number of respondents.

### 3.2. Cattle fattening practices

The majority (86.5%) of the respondents used the local market to get their fattening cattle followed by those who raised at home (13.5%), Figure 2. This is common in the mixed crop-livestock production systems of Ethiopia (Tadesse, 2018); however, it disagrees with the finding of Teshager et al. (2013) who reported that the majority (62.8%) of respondents obtained fattening cattle from their herd in Ilu Aba Bora Zone.

![Illustration of the source cattle for fattening in urban and peri-urban areas of Dangila district.](image-url)
Most of the cattle fatteners preferred matured (66%) and intact (65%) oxen followed by old oxen (20.5%) and castrated (35%) animals (Figure 3, Table 3). In the urban system, all the fatteners used intact bulls. Intact mature bulls are preferred, which might be due to their better weight gain efficiency and demand in the market as compared to other groups. Recently, there is a shift from castrating animals to fatten animals to get lean meat (Gebremichael et al., 2017; Tadesse, 2018). However, in the peri-urban system, there were farmers who used old (25.6%) and castrate (43.8%) cattle for fattening. The reason for this might be the source of the animals might be how grown after they use the animals for draft power. Similar to this, Demisse (2016) reported that the majority (86.7%) of fatteners in Bonke district used castrated cattle.

![Figure 3. The preferred age of cattle for fattening in urban and peri-urban areas of Dangila district.](https://doi.org/10.1080/23311932.2021.1963028)

| Variables                        | Peri-Urban N = 160 | Urban N = 40 | Overall N = 200 |
|----------------------------------|--------------------|--------------|-----------------|
|                                  | Freq. %            | Freq. %      | Freq. %         |
| Castration condition             |                    |              |                 |
| Castrated                        | 70 43.8            | 0 0          | 70 35           |
| Intact                           | 90 56.2            | 40 100       | 130 65          |
| Duration of fattening            |                    |              |                 |
| Two and half months              | 0 0.00             | 5 12.5       | 5 2.5           |
| Three months                     | 77 48.13           | 35 87.5      | 112 56          |
| Four months                      | 53 33.13           | 0 0.00       | 53 26.5         |
| Above Four months                | 30 18.75           | 0 0.00       | 30 15           |
| Have Credit access for fattening |                    |              |                 |
| Yes                              | 29 18.1            | 10 25        | 39 19.5         |
| No                               | 131 81.9           | 30 75        | 161 80.5        |

The majority of fatteners (index = 0.485) consider the body frame and condition of the animal followed by health condition (index = 0.162) to buy for fattening (Table 4). This result was in agreement with the finding of Demisse (2016) and Ayalew et al. (2019) who reported that the selection criteria for fattening cattle were frame size of animals ranked first in Bonke district and
### Table 4. Selection criteria for purchasing fattening cattle in urban and peri-urban areas of Dangila district

| Selection criteria          | Weight of frequency | Index | Rank |
|----------------------------|---------------------|-------|------|
|                            | 1       | 2 | 3  | 4  | 5  | 6  | 7  |     |
| Body size/frame             | 130     | 102 | 61 | 8  | 0  | 0  | 0  | 0.485 | 1   |
| Health condition            | 19      | 13  | 72 | 13 | 0  | 0  | 0  | 0.162 | 3   |
| Sex of animal               | 16      | 7   | 2  | 87 | 12 | 6  | 1  | 0.146 | 4   |
| Age of animal               | 11      | 6   | 50 | 5  | 0  | 2  | 6  | 0.102 | 5   |
| Price of animal             | 0       | 12  | 34 | 0  | 7  | 0  | 0  | 0.069 | 6   |
| Coat color                  | 5       | 2   | 2  | 11 | 9  | 0  | 7  | 0.035 | 7   |
Figure 4. Suitable seasons for Cattle fattening in the study area.

Gonder town, respectively. Similar to this result, Anteneh et al. (2010) reported that almost all traders in Amhara region of Ethiopia do not take coat color as criteria for the selection of fattening animals.

Season is an important factor to fatten cattle from different perspectives of feed availability and temperature (Figure 4). The majority (75%) of the fatteners prefer to start the fattening operation in October and finalize it in December. This was due to the seasonal pattern of feed availability, suitable environmental condition, and better market demand due to the main holidays (Ethiopian charismas). Scholars reported a similar result (Mulu, 2009).

In the study area, fatteners use different duration of fattening to which the majority (56%) of them feed cattle for 3 months followed by for 4 months (26.5%), Table 5. This agrees with the extension package in the region and the finding of Mekuria (2016) who reported that the durations for the fattening end was usually 3 months (83.33%) in North-Western Ethiopia. However, Teshager et al. (2013) reported a minimum of 4 months of duration of cattle fattening in Ilu Aba Bora Zone of Oromia regional state.

The average number fattening cattle (2.24 ± 2.74, with a range of 2–30 cattle) per cycle (Table 1) was larger (p < 0.001) in the urban system (4.35 ± 5.45 vs 1.71 ± 0.88). This might be because of the resource availability (e.g., credit service) and most of the fattening activities from the peri-urban are sideline activities. The result indicates, in both the systems, the cattle fattening practices are categorized under the small-scale cattle fattening category.

The majority (80.5%) of the respondents reported that they do not have access to credit service; only a small number (19.5) of them have access to credit from ASCI for cattle fattening. The current finding was similar to the results of Demisse (2016) in Bonke district.

Based on the survey result, stall feeding (76.5%) and grazing with stall feedings (23.5%) were the two types of feeding practices identified (Table 6). In the urban production system, all the respondents practiced stall feeding, whereas about 30% of the respondents use grazing and stall feeding. This might be due to the availability of grazing land in the peri-urban area. Similar results have been reported in southern Ethiopia (Wolde et al., 2014).

The feeding systems identified do not consider the body weight of animals (Table 6), and the majority (80.5%) of the respondents fed their animal twice a day, while the rest (19.5%) provide three and above times a day. A similar result was reported by Fekadu et al. (2017) that fatteners in Gonder town do not consider body weight when providing the feed.

The major type of water resource for the fattening animal in the study area was Hand Well water pipe (48%) followed by spring (27%) water. The majority of the respondents (78.0%)
Table 5. Credit service and management of fattening cattle in urban and peri-urban areas of Dangila district

| Parameters                     | Peri-Urban N = 160 | Urban N = 40 | Overall N = 200 |
|--------------------------------|---------------------|--------------|-----------------|
|                                | Freq. | %   | Freq. | %   | Freq. | %   |
| Feeding system                 |        |     |        |     |        |     |
| Stall feeding                  | 113    | 70.6| 40    | 100  | 153   | 76.5|
| Stall feeding with grazing     | 47     | 29.4| 0     | 0.00 | 47    | 23.5|
| Feed provision for animals     |        |     |        |     |        |     |
| Body weight based feeding      | 0      | 0.00| 0     | 0.00 | 0     | 0.00|
| Not body weight based feeding  | 160    | 100 | 40    | 100  | 200   | 100 |
| Frequency of feeding           |        |     |        |     |        |     |
| Twice per day                  | 130    | 81.25| 31     | 77.5| 161   | 80.5|
| Three times per day            | 26     | 16.25| 7      | 17.5| 33    | 16.5|
| Depending on appetite          | 4      | 2.5 | 2      | 5   | 6     | 3   |
| Sources of water               |        |     |        |     |        |     |
| Tape water                     | 0      | 0.0 | 34     | 85  | 34    | 17.0|
| River water                    | 16     | 10.0| 0.0    | 0.0 | 16    | 8.0 |
| Hand Well water pipe           | 91     | 56.9| 5      | 12.5| 96    | 48.0|
| Spring water                   | 53     | 32.5| 1      | 2.5 | 54    | 27.0|
| Watering frequency             |        |     |        |     |        |     |
| Once per day                   | 116    | 72.5| 40     | 100.0| 156   | 78  |
| Twice per day                  | 30     | 18.75| 0     | 0.00 | 30    | 15  |
| Any time required              | 14     | 8.75| 0      | 0.00 | 14    | 7   |
| Type of house used             |        |     |        |     |        |     |
| Separately constructed house   | 145    | 90.6| 40     | 100 | 185   | 92.5|
| Adjacent houses                | 11     | 6.9 | 0.0    | 0.0 | 11    | 5.5 |
| Separate room from main house  | 4      | 2.5 | 0.0    | 0.0 | 4     | 2.0 |
| Reasons of housing             |        |     |        |     |        |     |
| To protect from bad weather    | 18     | 11.3| 8      | 20.0| 26    | 13.0|

(Continued)
Table 5. (Continued)

| Parameters                        | Peri-Urban N = 160 | Urban N = 40 | Overall N = 200 |
|-----------------------------------|--------------------|--------------|-----------------|
|                                   | Freq. | %     | Freq. | %     | Freq. | %     |
| To protect from predators & thief | 30 | 18.8 | 6 | 15.0 | 36 | 18.0 |
| To provide supplements            | 9 | 5.6 | 7 | 17.5 | 16 | 8.0 |
| To save time and labor            | 103 | 64.4 | 19 | 47.5 | 122 | 61.0 |

provide water to their animals once per day. This study was in line with the finding of Beyene and Fufi (2017) who reported that the main water source for the fattening cattle was well water in Hurogudoro Wellega Zone. Ahmed et al. (2016), reported that more than half and the majority of peri-urban cattle fatteners in Dessie and Kombolcha areas, respectively, provided water once per day.

Most (92.5%) of the respondent farmers use a separately constructed house for their fattening animals (Table 6). A similar result on housing fattening cattle was previously reported elsewhere in Ethiopia (Beyene & Fufi, 2017; Demisse, 2016; Mulu, 2009).

3.3. Live weight change of fattening cattle in the study area

The mean initial body weight (291.433 ± 0.54; Table 7) of fattening animals was significantly different between the production systems (285.92 ± 1.56 vs. 296.2 ± 1.103 kg in peri-urban and urban fattening systems, respectively). The higher initial body weight in the urban fatteners might be due to the fact that those fatteners prefer to purchase large body framed animals with good body condition at the beginning for fattening, whereas in the peri-urban, fatteners may include some of their home-born animals (Figure 2).

The mean final body weight of fattening cattle in the urban and peri-urban areas of Dangila district is presented in Table 5. The initial body weight group significantly affected (p < 0.05) the final body weight that large body weight group (376.798 ± 3.07) outweighed the medium and light weight groups. The mean daily body weight gain observed (0.69 ± 0.014) was significantly different between the production systems that animals in the urban fattening system (0.74 ± 0.14 kg) gained significantly (P < 0.001) higher weight than the peri-urban fattening system (0.65 ± 0.02 kg), might be because of the better concentrate feed supply for fattening animals in the urban production system. Demisse (2016) and Ahmed et al. (2016) reported a similar daily weight gain in Bonke district, and Dessie & Kombolcha towns, respectively.

3.4. Challenges of beef cattle fattening

The major challenges of cattle fattening in the urban and peri-urban production systems of Dangila district are presented in Table 8. In the peri-urban areas, the major challenges were feed shortage in terms of availability and cost (index = 0.331) followed by the land shortage (index = 0.245). In the urban areas, feed shortage (index = 0.290) and lack of initial capital (index = 0.246) were the major challenges facing fattening households in Dangila districts. The result from the study agrees with previous studies (Ahmed et al., 2016; Anteneh et al., 2010; Demisse, 2016; Mulu, 2009) who found that cattle fattening in Ethiopia is challenged due to inadequate feed supply, shortage of animal feed (feed scarcity and quality deterioration of the feed during dry season), and high feed cost, poor quality and low availability of feed resources.
Table 6. Major feed resource used for cattle fattening in urban and peri-urban areas of Dangila district

| Feed staff                  | Peri-urban farms | Urban farms | Urban farms |
|-----------------------------|------------------|-------------|-------------|
|                             | 1st  | 2nd  | 3rd  | 4th | 5th | Index | 1st  | 2nd  | 3rd | 4th | 5th | Index |
| Crop residue                | 63   | 24   | 32   | 31  | 10  | 0.26  | 4    | 12   | 10  | 5   | 5   | 0.22  |
| Natural pasture (grasses)   | 41   | 34   | 20   | 45  | 0   | 0.22  | 2    | 8    | 2   | 1   | 0   | 0.092 |
| Conserved grass (hay)       | 20   | 13   | 33   | 0   | 56  | 0.15  | 3    | 10   | 12  | 5   | 1   | 0.19  |
| Local beverage by-product   | 15   | 21   | 38   | 13  | 67  | 0.18  | 0    | 4    | 13  | 12  | 0   | 0.16  |
| Agro industrial by-product  | 18   | 27   | 39   | 5   | 11  | 0.16  | 31   | 6    | 3   | 0   | 0   | 0.33  |
| Variables                  | N  | IBW(kg) (M± SE) | FBW(kg) (M± SE) | ADWG(kg) (M± SE) | Duration of fattening |
|----------------------------|----|----------------|----------------|------------------|----------------------|
| Overall mean               | 75 | 291.43 ± 0.54  | 365.44 ± 1.51  | 0.69 ± 0.01      | 107.38 ± .58         |
| Production system          |    | ***            | NS             | ***              | ***                  |
| Peri urban                 | 25 | 285.92 ± 1.56a | 360.50 ± 2.51  | 0.65 ± 0.02b     | 114.38 ± 0.93b      |
| Urban                      | 50 | 296.20 ± 1.10b | 370.62 ± 1.77  | 0.74 ± 0.01b     | 100.38 ± 0.68b      |
| Weight group               | 75 | ***            | ***            | NS               | NS                   |
| Small                      | 13 | 278.79 ± 1.08c | 352.79 ± 3.03c | 0.67 ± 0.03      | 106.92 ± 1.18       |
| Medium                     | 46 | 292.26 ± 0.59c | 366.73 ± 1.65c | 0.71 ± 0.02      | 107.04 ± 0.64       |
| Large                      | 16 | 303.24 ± 1.09c | 376.79 ± 3.07c | 0.73 ± 0.03      | 108.18 ± 1.19       |
| Constraint                        | Peri-urban farms | Urban farms | Index | Peri-urban farms | Urban farms | Index |
|----------------------------------|-------------------|-------------|-------|-------------------|-------------|-------|
| Feed shortage                    | 112               | 27          | 16    | 5                 | 0           | 0.331 |
| Land shortage                    | 34                | 58          | 25    | 27                | 6           | 0.245 |
| Lack of capital                  | 10                | 39          | 48    | 30                | 4           | 0.189 |
| Absence of market linkage        | 0                 | 7           | 22    | 42                | 29          | 0.094 |
| Animal health problem            | 4                 | 29          | 43    | 15                | 12          | 0.140 |

Notes: Tw = total weight; Index = sum of all single constraint rank ((5 for 1) + (4 for 2) + (3 for 3) + (2 for 4) + (1 for 5)) divided by sum of all weighted constraint of beef cattle production mentioned by respondent.
3.5. Conclusion

The cattle fattening system in Dangilo district is immersing as a business. The study revealed that there is a difference in the fattening systems between the urban and peri-urban systems. In general, the fattening system is based on small number of animals which might be due to lack of credit access. The urban fatteners prefer to use large body framed animals with good body condition which helped them attain larger body weight animals. The peri-urban system mostly depends on roughage feed which in turn prolonged the fattening duration, while the urban depends on concentrate feed. Feed shortage in terms of availability and cost is the most important constraint in the district. Therefore, cattle fatteners should get the proper advice on animal selection and duration of fattening, feeding, and accessibility to credit service.

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