Inhibiting factors on the sustainable livestock development: case of dairy cattle in Indonesia

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Abstract. Sustainable livestock development is still a national strategic issue in Indonesia. The research objective was to examine the inhibiting factors for sustainable livestock development, especially for dairy cows. The research was carried out at the Tirtasari Kresna Gemilang, Joint Business Group (KUB) animal husbandry institution, Malang District, East Java Province. Research variables include inhibiting factors (X), ecological dimensions (Y₁), economical dimensions (Y₂), social and cultural dimensions (Y₃), institutional dimensions (Y₄), and technological dimensions (Y₅). Respondents of the study were 196 dairy cattle farmers who were members of KUB Tirtasari Kresna Gemilang. The data were obtained using the Focus Group Discussion (FGD) method and survey with a likert scale. Data were analyzed partially using simple linear regression. The results showed that the inhibiting factors had a negative and significant effect on sustainable livestock development, especially in the economical dimensions, the social and cultural dimensions, the institutional dimension, and the technological dimension. This shows that the inhibiting factors for sustainable livestock development should be the concern of all stakeholders in the national dairy industry.

1. Introduction
The definition of sustainable livestock development is the process of building or developing a livestock rearing business with the aim of breeding and fattening which is carried out continuously and continuously. The term sustainable based on the Republic of Indonesia of Law Number 22 of 2019 about Sustainable Agricultural Cultivation Systems is the management of living natural resources in producing agricultural commodities in order to better and sustainably meet human needs by preserving the environment.

Sustainable livestock development in principle has 5 (five) dimensions, namely the ecological dimension, the economical dimension, the social and cultural dimension, the institutional dimension, and the technological dimension [1-4], but the fact is that efforts to develop sustainable livestock always experience various obstacles and problems, including the main problems at the community farm level [5]. Government Regulation No. 6 of 2013 about Farmer Empowerment as an effort to support sustainable smallholder livestock. Empowerment of farmers can be done through livestock institutions [6].

Government Regulation Number 6 of 2013 states that farmer empowerment is all efforts made by the government, provincial governments, city/district governments, and stakeholders in the field of animal husbandry and health to increase independence, provide convenience and business progress, and improve competitiveness and farmer welfare. Efforts to empower farmers that are closely related to
sustainable livestock development include a plant-livestock integration system with a zero waste concept ([7-12], utilization of local resources [13] to suppress imports [14].

Various efforts made by the government in supporting sustainable livestock development are not necessarily without inhibiting factors [15]. Inhibiting factors can widen the gap between expectations and reality. Inhibiting factors are divided into internal and external barriers. Internal barriers are in the form of weaknesses (weaknesses), while external barriers are in the form of threats (threats). Internal blockers can be controlled, while external barriers are difficult to control. Various terms that are closely related to inhibiting factors are aspects of vulnerability [16-19], and aspects of business risk [20-21]. The inhibiting factor must be the attention of the government and all stakeholders, because no matter how good the plan, it will be in vain if you never learn from the past.

This study aims to examine the inhibiting factors for sustainable livestock development in the Joint Business Group (KUB) of Tirtasari Kresna Gemilang, Malang District. The novelty of this study is to review the influence of the inhibiting factors on each dimension of sustainable livestock development, namely there are 5 dimensions, the ecological dimension, the economical dimension, the social and cultural dimension, the institutional dimension, and the technological dimension. The contribution of this article as a means of developing science considering the development of science can be done with the findings of research results. Another contribution is that the importance of this article is as a public policy database, considering that public policy requires academic texts as its foundation.

2. Materials and methods

2.1. Materials

The research consists of 6 main variables, namely inhibiting factors and 5 dimensions of sustainable livestock development which include ecological dimensions, economical dimensions, social and cultural dimensions, institutional dimensions, and technological dimensions. The inhibiting factors act as independent variables, while the five dimensions of sustainable livestock development are the dependent variables. The indicators of each variable are described in Table 1.

| Variables and indicators | Variables and indicators |
|--------------------------|--------------------------|
| Inhibiting factor (X)    |                          |
| a. Does not have a permanent partnership with the Dairy Processing Industry (IPS) | X1.1 |
| b. Lack of capital to form new business units (product diversification) | X1.2 |
| c. Human Resources (HR) is low | X1.3 |
| d. Milk laboratory equipment is not complete | X1.4 |
| e. Farmers morality (honesty) | X1.5 |
| f. Competition with other livestock groups | X1.6 |
| g. Assistance from the central and local governments is still limited | X1.7 |
| h. There is no government intervention in determining the selling price of fresh milk | X1.8 |

| Ecological dimension (Y1) | Ecological dimension (Y1) |
|---------------------------|---------------------------|
| a. Providing forage for livestock | Y1.1 |
| b. Provide protective plants | Y1.2 |
| c. Make use of unused land | Y1.3 |
| d. Processing and managing livestock waste | Y1.4 |
| e. Utilizing livestock manure | Y1.5 |
| f. Pay attention to the slope of the cage | Y1.6 |
| g. Pay attention to the height of the cage | Y1.7 |
| h. Pay attention to the density of the cage | Y1.8 |
| i. Providing clean water to support livestock business | Y1.9 |
| j. Pay attention to the humidity of the cage | Y1.10 |
| E Y | Description |
|-----|-------------|

**k. Pay attention to the temperature of the cage**

**Economical dimension (Y2)**

| Y2 | Description |
|----|-------------|
| 1  | Providing livestock production facilities |
| 2  | Marketing of milk and dairy products |
| 3  | Analyzing the amount of subsidies for livestock production facilities |
| 4  | Manage production requests |
| 5  | Distribute labor |
| 6  | Own a farm |
| 7  | Owning livestock |
| 8  | Providing working capital |
| 9  | Contributing to Regional Original Income (PAD) |
| 10 | Determining farm labor wages |
| 11 | Increase livestock business income |

**Social and cultural dimension (Y3)**

| Y3 | Description |
|----|-------------|
| 1  | Making time for business in the field of animal husbandry |
| 2  | Supporting family participation in livestock farming |
| 3  | Managing the environment as a result of the existence of a livestock business |
| 4  | Determining the number of business actors in the livestock sector |
| 5  | Respond to community complaints and protests if they are the impact of livestock business |
| 6  | Responding to the needs of the farming community |
| 7  | Increase income in the livestock sector |
| 8  | Improve knowledge and skills in the field of animal husbandry |

**Institutional dimension (Y4)**

| Y4 | Description |
|----|-------------|
| 1  | Participate in livestock coaching/extension programs |
| 2  | Collaborating with the government in an effort to support sustainable livestock development |
| 3  | Collaborating with role models in an effort to support sustainable livestock development |
| 4  | Participate in livestock organizations or institutions |
| 5  | Collaborating with credit providing institutions in an effort to support livestock development |
| 6  | Cut the chain of trade (marketing) of livestock commodities |
| 7  | Empowering livestock institutions |
| 8  | Creating a marketing network for livestock commodities |

**Technological dimension (Y5)**

| Y5 | Description |
|----|-------------|
| 1  | Managing the biological environment |
| 2  | Having and mastering communication tools to support livestock business |
| 3  | Mastering housing technology |
| 4  | Mastering technology for processing and utilizing livestock waste limbah |
| 5  | Participate in livestock extension program penyuluhan |
| 6  | Improving the formal education of workers/employees |
| 7  | Knowledge of feed and feed processing |
| 8  | Knowing about livestock health |
| 9  | Knowledge of livestock reproduction |
| 10 | Knowledge of livestock rearing management |
| 11 | Knowing about livestock product processing technology |
| 12 | Mastering the vehicle to support the livestock business |
| 13 | Own and control livestock product processing machines |
2.2. Methods
The research was conducted from August to October 2020 at the Joint Business Group (KUB) of Tirtasari Kresna Gemilang, Malang District, East Java Province. KUB Tirtasari Kresna Gemilang is a dairy farming institution that has business units for animal feed and fresh milk marketing. They have 196 dairy farmers spread over Ngabab Village, Pujon Subdistrict and its surroundings. The research sample is all dairy farmers who are members of KUB Tirtasari Kresna Gemilang. Data were collected using Focus Group Discussion (FGD) and survey methods. The survey method was carried out by means of interviews and filling out questionnaires with a Likert scale of +1 to +5.

Research data consists of primary data and secondary data. Primary data was obtained directly from dairy farmers who are members of KUB Tirtasari Kresna Gemilang, while secondary data was obtained from various supporting sources, such as daily and monthly reports of KUB Tirtasari Kresna Gemilang, Central Statistics Agency, Department of Livestock and Animal Health. The primary data were then partially analyzed using simple linear regression with SPSS 26.0 Software. Mathematically, the simple linear regression equation based on Figure 1 is as follows:

$$ Y = a + bX $$

Y indicates the criterion variable or 5 (five) dimensions of sustainable livestock development, namely the ecological dimension ($Y_1$), the economical dimension ($Y_2$), the social and cultural dimension ($Y_3$), the institutional dimension ($Y_4$), and the technological dimension ($Y_5$), and $X$ shows predictor variables or inhibiting factors, while $a$ is a constant variable and $b$ is a linear regression direction coefficient.

3. Results and discussion
Efforts to evaluate the impact of inhibiting factors on sustainable livestock development are solely carried out to support farmer empowerment in accordance with Government Regulation of the Republic of Indonesia Number 6 of 2013 concerning Farmers Empowerment. The effect of inhibiting factors on sustainable livestock development on the ecological dimension is shown in Table 2.

| Coefficientsa |  |
|---------------|---|
| model | Unstandardized coefficient | Standardized coefficient | t | Sig. |
| (Constant) | 34.419 | 5.904 | 5.838 | .000 |
| IF | -.289 | .234 | -.486 | -1.646 | .005 |

The results of the linear regression analysis in Table 2 show that the inhibiting factor has a negative effect on the ecological dimension of -.289, because the regression coefficient is negative, then the regression equation is $Y = 34.419 - .289X$. These inhibiting factors have a negative but not significant effect on the ecological dimension. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the ecological dimension is quite good so it is not influenced by inhibiting factors. The availability of land used to grow forage in the form of grass and agricultural waste is one of the driving factors, especially KUB Tirtasari Kresna Gemilang provides complete feed for members. One form of service of KUB Tirtasari Kresna Gemilang to its members is to send animal feed directly to the location of the cage. This form of service is carried out to maintain member satisfaction and loyalty [22-25] stated that feed is one of the three pillars of livestock business. The three pillars of livestock business are breeding, feeding, and management. The influence of the inhibiting factors on sustainable livestock development on the economic dimension is shown in Table 3.
Table 3. Inhibiting factors and economical dimensions

| Coefficientsa | model | Unstandardized coefficient | Standardized coefficient | t    | Sig.  |
|---------------|-------|----------------------------|--------------------------|------|-------|
|               | B     | Std. Error                 | Beta                     |      |       |
| (Constant)    | 28.423| 2.615                      |                          | 5.838| .000  |
| IF            | -0.481| 0.114                      | -0.486                   | -4.623| .001  |

a. Dependent variable: economical dimensions
b. t tabel : 1.652
c. IF : inhibiting factors

The results of the linear regression analysis in Table 3 show that the inhibiting factor has a negative effect on the economical dimension of -0.486, because the regression coefficient is negative, then the regression equation is $Y = 28.423 - 0.481X$. These inhibiting factors have a negative and significant effect on the economical dimension. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the economical dimension is not good enough so that it is influenced by inhibiting factors. Not having a permanent partnership with the Dairy Processing Industry (IPS), limited capital, competition with other livestock groups, and limited assistance from the central and regional governments are the main causes of the weak economical dimension. The economic dimension also supports the development of livestock business [26-28]. The influence of the inhibiting factors on sustainable livestock development on the social and cultural dimensions is shown in Table 4.

Table 4. Inhibiting factors and social and cultural dimensions

| Coefficientsa | model | Unstandardized coefficient | Standardized coefficient | t    | Sig.  |
|---------------|-------|----------------------------|--------------------------|------|-------|
|               | B     | Std. Error                 | Beta                     |      |       |
| (Constant)    | 35.126| 2.819                      |                          | 6.816| .000  |
| IF            | -0.334| 0.137                      | -0.515                   | -4.424| .001  |

a. Dependent variable: social and cultural dimensions
b. t tabel : 1.652
c. IF : inhibiting factors

The results of the linear regression analysis in Table 4 show that the inhibiting factor has a negative effect on the social and cultural dimensions of -0.334, because the regression coefficient is negative, then the regression equation is $Y = 35.126 - 0.334X$. These inhibiting factors have a negative and significant effect on the social and cultural dimensions. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the social dan cultural dimension is not good enough so that it is influenced by inhibiting factors. The morality of breeders, incomplete milk laboratory equipment, the absence of government intervention in determining the selling price of fresh milk, and the low human resources of farmers are the main causes of weak social and cultural dimensions. Human resources of farmers as the driving force of livestock business have a vital role in the development of livestock business [29-32]. The influence of the inhibiting factors on sustainable livestock development on the institutional dimension is shown in Table 5.
Table 5. Inhibiting factors and institutional dimensions

| model   | Unstandardized Coefficient | Standardized Coefficient | t     | Sig.  |
|---------|----------------------------|--------------------------|-------|-------|
| (Constant) | 29.552                     | 2.714                    | 10.256 | .000  |
| IF      | -0.465                     | 0.128                    | -0.649 | -4.847| .001  |

a. Dependent variable : institutional dimensions
b. t tabel : 1.652
c. IF : inhibiting factors
Sources : data processed, 2021

The inhibiting factor has a negative effect on the institutional dimensions of -0.465, because the regression coefficient is negative, then the regression equation is $Y = 29.552 - 0.465X$. These inhibiting factors have a negative and significant effect on the institutional dimensions. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the institutional dimension is not good enough so that it is influenced by inhibiting factors. Not having a permanent partnership with the Dairy Processing Industry (IPS), lack of capital to form new business units (product diversification), breeder morality (honesty), and competition with other livestock groups are the main causes of weak institutional dimensions. [33,34] states that farmer institutions are able to strengthen farmer access to resources. These resources play an important role in the development of farming business [35,36]. The influence of the inhibiting factors on sustainable livestock development on the technology dimension is shown in Table 6.

Table 6. Inhibiting factors and technological dimensions

| model   | Unstandardized Coefficient | Standardized Coefficient | t     | Sig.  |
|---------|----------------------------|--------------------------|-------|-------|
| (Constant) | 35.414                     | 2.615                    | 12.550 | .000  |
| IF      | -0.379                     | 0.112                    | -0.818 | -4.419| .001  |

a. Dependent variable : technological dimensions
b. t tabel : 1.652
c. IF : inhibiting factors
Sources : data processed, 2021

The inhibiting factor has a negative effect on the technological dimension of -0.379, because the regression coefficient is negative, then the regression equation is $Y = 35.414 - 0.379X$ (Table 6). These inhibiting factors have a negative and significant effect on the technological dimensions. These conditions indicate that the role of KUB Tirtasari Kresna Gemilang on the technological dimension is not good enough so that it is influenced by inhibiting factors. The low human resources of farmers, incomplete milk laboratory equipment, and limited assistance from the central and local governments are the main causes of the weakness of the technological dimension. The technological dimension is part of the livestock business resources [37,38].

4. Conclusions

Inhibiting factors had a negative and significant effect on sustainable livestock development, especially in the economical dimensions of -0.481, the social and cultural dimensions of -0.334, the institutional dimension of -0.465, and the technological dimension of -0.379. Inhibiting factors for sustainable livestock development should be the concern of all stakeholders in the national dairy industry. These inhibiting
factors include does not have a permanent partnership with the Dairy Processing Industry (IPS), lack of capital to form new business units (product diversification), Human Resources (HR) is low, milk laboratory equipment is not complete, farmers morality (honesty), competition with other livestock groups, assistance from the central and local governments is still limited, there is no government intervention in determining the selling price of fresh milk.

References
[1] Suyitman, Sutjahjo S H, Herison C and Muladno M 2009 Status keberlanjutan wilayah berbasis pengembangan kawasan agropolitan Agro Ekon. 27 165–91
[2] Zhao Z, Chen J, Bai Y and Wang P 2020 Assessing the sustainability of grass-based livestock husbandry in Hulun Buir, China Phys. Chem. Earth 120 102907
[3] van der Linden A, de Olde E M, Mostert P F and de Boer I J M 2020 A review of European models to assess the sustainability performance of livestock production systems Agric. Syst. 182 102842
[4] Tarawali S, Herrero M, Descheemaeker K, Grings E and Blümmel M 2011 Pathways for sustainable development of mixed crop livestock systems: Taking a livestock and pro-poor approach Livest. Sci. 139 11–21
[5] Harsita P A and Amam A 2019 Permasalahan utama usaha ternak sapi potong di tingkat peternak dengan oendekatan Vilfredo Pareto Analysis Pros. Semin. Nas. Teknol. Peternak. dan Vet. 241–50
[6] Amam A and Soetiono S 2019 Evaluasi performa kelembagaan peternak sapi perah berdasarkan aspek risiko bisnis dan pengembangan usaha J. Trop. Anim. Sci. Technol. 6 8–13
[7] Ali H M, Yusuf M and Syamsu J A 2010 Prospek pengembangan peternakan berkelanjutan melalui sistem integrasi tanaman-ternak model zero waste di Sulawesi Selatan Semin. Nas. Peningkatan Akses Pangan Hewani melalui Integr. Pertanian-Peternakan Berkelanjutan menghadapi Era ACFTA 1–10
[8] Karisaya K 2017 Sistem integrasi tanaman-ternak dalam perspektif reorientasi kebijakan subsidi pupuk dan peningkatan pendapatan petani Anal. Kebijak. Pertan. 3 68–80
[9] Hidayat N, Soeharsono S and Widodo S 2016 Keberlanjutan sistem usaha tani integrasi tanaman-ternak pasca bencana alam gempa bumi di Daerah Istimewa Yogyakarta Sains Peternak. 7 30
[10] Bamualim A M, Madarisa F, Pendra Y, Mawardi E and Asmak A 2015 Kajian inovasi integrasi tanaman-ternak melalui pemanfaatan hasil ikutan tanaman sawit untuk meningkatkan produksi sapi lokal Sumatera Barat J. Peternak. Indonesia. 17 83-93
[11] Nayak P K, Nayak A K, Panda B B, Lal B, Gautam P, Poonam A, Shahid M, Tripathi R, Kumar U, Mohapatra S D and Jambhulkar N N 2018 Ecological mechanism and diversity in rice based integrated farming system Ecol. Indic. 91 359–75
[12] McDonald C K, MacLeod N D, Lisson S and Corfield J P 2019 The integrated analysis tool (IAT) – a model for the evaluation of crop-livestock and socio-economic interventions in smallholder farming systems Agric. Syst. 176
[13] Bahri S and Tiesnamurti B 2013 Strategi pembangunan peternakan berkelanjutan dengan memanfaatkan sumber daya lokal J. Penelit. dan Pengemb. Pertan. 31 30919
[14] Amam A and Haryono H 2021 Pertambahan bobot badan sapi impor Brahman Cross heifers and steers pada bobot kedatangan yang berbeda J. IImu Peternak. Terap. 4 104–9
[15] Soetiono S, Soejono D, Zahroza D B, Maharani A D and Amam A 2019 Strategi pengembangan dan diversifikasi sapi potong di Jawa Timur J. IImu dan Teknol. Peternak. Trop. 6 138–45
[16] Amam A and Harsita P A 2019 Aspek kerentanan usaha ternak sapi perah di Kabupaten Malang Agrimor J. Agribisnis Lahan Kering 4 26–8
[17] Amam A and Harsita P A 2019 Pengembangan usaha ternak sapi perah : Evaluasi konteks kerentanan dan dinamika kelompok J. IImu-IImu Peternak. 22 23–34
[18] Amam A and Solikin N 2020 The effect of resources on institutional performance and vulnerability aspects of dairy cattle businesses EBGC 1–9
[19] Amam A, Jadmiko M W and Harsita P A 2020 Institutional performance of dairy farmers and the impacts on resources Agrar. J. Agribus. Rural Dev. Res. 6 63–73
[20] Amam A and Harsita P A 2019 Efek domino performa kelembagaan, aspek risiko, dan pengembangan usaha terhadap SDM peternak sapi perah J. Penelit. Ilmu Peternak. 17 5–11
[21] Amam A, Jadmiko M W, Harsita P A, Yulianto R, Widodo N, Soetiriono S and Poerwoko M S 2020 Usaha ternak sapi perah di Kelompok Usaha Bersama (KUB) Tirtasari Kresna Gemilang: Identifikasi sumber daya dan kajian aspek kerentanan J. Ilmu Peternak. dan Vet. Trop. (Journal Trop. Anim. Vet. Sci. 10 77
[22] Amam A and Harsita P A 2017 Mengkaji kepuasan dan loyalitas konsumen susu bubuk tinggi kalsium dengan pendekatan multi-atribut JSEP 10 16–22
[23] Amam A, Fanani Z and Nugroho B A 2016 Analisis sikap konsumen terhadap susu bubuk berkalsium tinggi dengan menggunakan multi-atribut model dan norma subyektif model Wacana, J. Sos. dan Hum. 19 12–21
[24] Harsita P A and Amam A 2019 Analisis sikap konsumen terhadap produk olahan singkong Agrisocionomics J. Sos. Ekon. dan Kebijak. Pertan. 3 19–27
[25] Amam A and Harsita P A 2019 Tiga pilar usaha ternak J. Sains Peternak. Indones. 14 431–9
[26] Amam A, Fanani Z, Hartono B and Nugroho B A 2019 Pengembangan usaha ternak ayam pedaging sistem kemitraan bagi hasil berdasarkan aksesibilitas peternak terhadap sumber daya J. Ilmu dan Teknol. Peternak. Trop. 6 146–53
[27] Amam A, Fanani Z, Hartono B and Nugroho B A 2019 Broiler livestock business based on partnership cooperation in Indonesia: the assessment of opportunities and business developments Int. J. Entrep. 23 1–11
[28] Amam A, Fanani Z, Hartono B and Nugroho B A 2019 The power of resources in independent livestock farming business in Malang District, Indonesia IOP Conference Series: Earth and Environmental Science 372 pp 1–9
[29] Amam A, Fanani Z, Hartono B and Nugroho B A 2019 Identification of resources in the system of broiler farming business J. Ilmu Ternak dan Vet. 24 135–42
[30] Amam A, Fanani Z, Hartono B and Nugroho B A 2019 Usaha ternak ayam pedaging sistem kemitraan pola dagang umum: pemetaan sumber daya dan model pengembangan Sains Peternak. 17 5–11
[31] Amam A, Fanani Z, Hartono B and Nugroho B A 2019 Identifikasi sumber daya finansial, teknologi, fisik, ekonomi, lingkungan, dan sosial pada usaha ternak ayam pedaging Pros. Semin. Nas. Teknol. Peternak. dan Vet. 738–46
[32] Amam A, Harsita P A, Jadmiko M W and Romadhona S 2021 Aksesibilitas sumber daya pada usaha peternakan sapi potong rakyat J. Peternak. 18 31–40
[33] Soetiriono S and Amam A 2020 The performance of institutional of dairy cattle farmers and their effects on financial, technological, and physical resources J. Ilmu-Ilmu Peternak. 30 128–37
[34] Amam A, Setyawan H B, Jadmiko M W, Harsita P A, Rusdiana S and Luthfi M 2021 Pengaruh sumber daya manusia terhadap aksesibilitas sumber daya usaha ternak sapi potong rakyat J. Ilmu dan Teknol. Peternak. Trop. 8 57–65
[35] Amam A, Jadmiko M W, Harsita P A and Poerwoko M S 2019 Model pengembangan usaha ternak sapi perah berdasarkan faktor aksesibilitas sumber daya J. Sain Peternak. Indones. 14 61–9
[36] Amam A, Jadmiko M W, Harsita P A, Widodo N and Poerwoko M S 2019 Sumber daya internal peternak sapi perah dan pengaruhnya terhadap dinamika kelompok dan konteks kerentanan J. Ilm. Peternak. Terpadu 7 192–200
[37] Amam A, Yulianto R, Jadmiko M W and Harsita P A 2019 Kekuatan sumber daya (ekonomi, lingkungan, dan sosial) dan pengaruhnya terhadap SDM peternak dan kelembagaan peternak sapi perah Pros. Semin. Nas. Teknol. Peternak. dan Vet. 225–35
[38] Amam A, Yulianto R, Widodo N and Romadhona S 2020 Pengaruh aspek kerentanan terhadap aksesibilitas sumber daya usaha ternak sapi potong Livest. Anim. Res. 18 160-70