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Analysis of Business Characteristics and Motivation of Beef Cattle Farmers through an Ethnic Approach in Central Bangka Regency

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ABSTRACT

This study aims to examine the characteristics of beef cattle farming, the motivation of Malay and Chinese ethnic farmers, and to identify the factors influencing their motivation. The research was conducted from March to December 2024 in Central Bangka Regency, Bangka Belitung Islands Province, where livestock farming has become an increasingly important livelihood. A total of 100 respondents were involved, consisting of 50 Malay and 50 Chinese beef cattle farmers. Respondents were selected using purposive sampling, with the inclusion criteria being beef cattle farmers of Malay and Chinese ethnicity who resided in Pangkalan Baru District and were actively engaged in beef cattle production. Data were collected using structured questionnaires and analysed using descriptive statistics and multiple linear regression. The results show significant differences in business characteristics between the two ethnic groups, particularly in sources of finance, market access, and business orientation. Both Malay and Chinese farmers demonstrated high levels of motivation, driven by both economic and socio-cultural factors. The analysis revealed that cattle farming experience ($p < 0.05$), cattle herd size ($p < 0.05$), and ethnicity ($p < 0.01$) significantly influenced farmer motivation. These findings highlight the role of ethnic background and farming experience in shaping farmers' motivation, which is essential for designing culturally sensitive livestock development strategies in the region.

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Introduction

The beef cattle farming sector in the Bangka Belitung Islands Province has shown promising development over the past few years. Cattle populations increased from 12,644 in 2017 to 19,741 in 2024 (Regional Statistics of the Bangka Belitung Islands Province, 2024). This growth is supported by the availability of land resources suitable for livestock rearing and forage production. Key areas in the province offer sources of forage, including plantations (160,327 hectares), rice fields (25,093 hectares), oil palm plantations (48,351.9 hectares), and forest areas (43,661 hectares). Forage availability plays a vital role in supporting beef cattle growth and productivity (Imaz *et al.*, 2019). Recognising this potential, the local government has prioritised beef cattle development in the Regional Medium-Term Development Plan (RPJMD), including initiatives such as the “Babel Lumpat” (*Bangka Belitung Lumbung Pangan Asal Ternak*) programme aimed

at positioning the province as a livestock production hub in Sumatra (Alamsyah *et al.*, 2022).

In addition to natural resources, the sector's growth is also driven by demographic and economic shifts. The number of livestock-farming households increased from 14,895 in 2013 to 16,181 in 2023 (BPS-Statistics, 2023), indicating rising public interest in cattle farming. Concurrently, employment in the tin mining sector declined from 9.55% of the population in 2021 to 8.60% in 2022 suggesting a growing inclination toward alternative and more sustainable livelihoods such as livestock production. This transition reflects the evolving economic landscape in Bangka Belitung and the increasing potential of cattle farming to contribute to rural income and regional food security.

An important yet underexplored dimension of this development is the role of ethnicity in shaping the structure and motivation of cattle farmers. The population of Bangka Belitung is largely comprised of two ethnic groups: Malay and Chinese. Although neither group has a long-standing tradition as full-time pastoralists, many

individuals from both communities have recently become involved in beef cattle farming (Waldron & Brown, 2014; Mohd Saufi *et al.*, 2023). Exploring their participation is crucial, as ethnicity may influence access to resources, scale of ownership, management styles, and business goals.

Studies from other countries have shown how ethnic identity can shape livestock farming patterns. In Benin, Fulani farmers typically manage larger cattle populations than other ethnic groups (Worogo *et al.*, 2020; Houessou *et al.*, 2022). In Nigeria, the Fulani and Bariba ethnic groups use the same cattle breed for entirely different purposes, herd growth vs. ceremonial use (Houessou *et al.*, 2019). These variations underscore the importance of considering ethnic context in livestock research.

Motivation is another key factor affected by ethnic background. In livestock farming, motivation influences not only business operations but also long-term decision-making and investment behaviours (Hendrayani, 2009). Othman *et al.* (2019) found that in Malaysia, Malay and Chinese farmers differ in their farming motivations, shaped by cultural norms and values. Malay farmers are often influenced by optimism and community-oriented customs, while Chinese farmers emphasize discipline, perseverance, and family business traditions (Elvinawanty *et al.*, 2020). Such differences may lead to contrasting approaches in cattle farming strategies, goals, and levels of engagement.

In Bangka Belitung, traditional practices also reflect ethnic motivations. For instance, Chinese families often slaughter cattle before Chinese New Year (Lim & Wishnoebroto, 2016), while Malay families use beef in ceremonial dishes during the *Ruahan* tradition (Evawarni, 2009). These cultural rituals reveal that cattle farming is not only an economic activity, but also a socially and symbolically meaningful practice.

Despite these trends, research exploring how ethnicity affects cattle farming in Bangka Belitung remains limited. Previous studies have not examined how Malay and Chinese ethnic groups differ in their business characteristics and motivations in this emerging livestock sector. Therefore, this study seeks to fill this gap by analysing the business characteristics and motivational drivers of Malay and Chinese beef cattle farmers in Central Bangka Regency. The findings are expected to provide new insights into the role of ethnicity in shaping livestock development and inform more culturally responsive policy interventions and farmer empowerment strategies.

Materials and Methods

The research was conducted in Central Bangka Regency, Bangka Belitung Islands Province, from March to June 2024. The study focused on Pangkalan Baru District, which was selected purposively based on its high

concentration of active beef cattle farming and the presence of two dominant ethnic groups—Malay and Chinese—who are both engaged in livestock production.

Respondents were selected using purposive sampling, which was considered appropriate for targeting specific subgroups with relevant characteristics aligned with the study's objectives. The inclusion criteria required that respondents be actively involved in beef cattle farming, self-identify as Malay or Chinese, and reside in Pangkalan Baru District. Because the total number of beef cattle farmers in the area was unknown, the minimum sample size was determined using the Lemeshow formula (1997), which is commonly used when the population size is undefined:

$$n = \frac{z^2 \cdot p(1-p)}{d^2}$$

Where:

n = minimum sample size

z = z -score for a 95% confidence level (1.96)

p = estimated proportion of the population (0.5)

d = margin of error (0.10)

Substituting these values gives:

$$n = \frac{(1.96)^2 \cdot 0.5(1-0.5)}{(0.10)^2}$$

$$n = 96.04$$

To ensure both statistical adequacy and an equal representation of both ethnic groups, the final sample size was rounded up to 100 respondents, consisting of 50 Malay and 50 Chinese beef cattle farmers. This approach enabled comparative analysis between the two groups regarding their business characteristics and motivational drivers.

Primary data were collected using a structured questionnaire designed to capture variables related to livestock business characteristics and motivational factors. Farmer motivation was analysed using the Existence, Relatedness, and Growth (ERG) framework (Alderfer, 1969; Trout *et al.*, 2024). Motivation variables were measured using a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire was pre-tested and evaluated for validity ($r > 0.05$) and internal consistency (Cronbach's $\alpha > 0.800$).

Statistical Analysis

Descriptive analysis was used to examine the business characteristics of Chinese and Malay ethnic farmers. The motivation category is determined by the range between the maximum and minimum scores, which is divided into two levels: high and low, as presented in Table 2. Multiple linear regression analysis was employed to identify the factors influencing the motivation of Chinese and Malay farmers. The regression equation is as follows:

$$Y = \alpha + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \beta_5X_5 + \beta_6X_6 + \varepsilon$$

Explanation: motivation (Y), constant (α), (X3), land size (X4), cattle herd size (X5), ethnicity regression coefficients (β_i), farmer's age (X1), (X6), error (ϵ).
formal education (X2), cattle farming experience

Table 2. Categories of Beef Cattle Farmers' Motivation Scores

Indicators	Maximum score	Minimum score	High category	Low category
Existence	85	17	51 – 85	17 – 50
Relatedness	75	15	45 – 75	15 – 44
Growth	85	17	51 – 85	17 – 50
Motivation	245	49	149 – 245	49 – 148

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Results and Discussion

Table 1. Characteristics of Beef Cattle Farmers and Beef Cattle Business in Central Bangka Regency

Variable	Ethnic group			
	Chinese (people)	Percentage (%)	Malay (people)	Percentage (%)
Characteristics				
Gender				
Male	47	92	49	98
Woman	3	6	1	2
Formal Education				
No formal education	1	2	0	0
Elementary school	23	46	22	44
Junior high school	8	16	8	16
Senior high school	17	34	15	30
College / Bachelor's degree (S1)	1	2	5	10
Farmers' Age				
≤15 years	0	0	0	0
15-64 years	38	76	47	94
≥65 years	12	24	3	6
Cattle Herd Size				
1-3 heads	24	48	22	44
4-10 heads	22	44	24	48
>10 heads	4	8	4	8
Cattle Farming Experience				
≤15 years	46	92	47	94
16-29 years	1	2	2	4
≥30 years	3	6	1	2
Land Status				
Privately owned land	44	88	36	72
Non-private / communal / borrowed land	6	12	14	28
Land Size				
Small (<0.5 ha)	38	76	36	72
Medium (0.5–1 ha)	5	10	5	10
Large (>1 ha)	7	14	9	18
Business characteristics				
Business scale				
Small-scale	24	48	22	44
Medium-scale	22	44	24	48
Large-scale	4	8	4	8
Livestock ownership status				
Fully owned	34	68	48	96
Shared ownership	5	10	1	2
Mixed ownership	11	22	1	2
Livestock Rearing Pattern				
Intensive	4	8	2	4
Semi-intensive	40	80	48	96
Extensive	6	12	0	0
Market Access				
Direct-to-consumer	16	32	35	70
Through intermediaries / middlemen	34	68	15	30
Business Orientation				
Sideline / Subsidiary income	36	72	27	54
Complementary business	5	10	15	30
Primary source of income	0	0	3	6
Commercial / Industrial-scale enterprise	9	18	5	10
Source of capital				
Personal capital	22	44	36	72
External capital (e.g., loans, group funds, partnerships)	28	56	14	28

Source: Primary data (2024)

Characteristics of Cattle Farmers and Beef Cattle Business in Central Bangka Regency

The characteristics of beef cattle farmers and their businesses form the foundation for understanding how ethnicity, experience, and resources influence cattle farming strategies. Table 1 outlines the demographic and beef cattle farming characteristics of Chinese and Malay ethnic groups in Central Bangka Regency.

Gender

The data reveal that beef cattle farming in both ethnic groups is predominantly a male-dominated activity, with 92% of Chinese and 98% of Malay farmers being men. This pattern reflects broader socio-cultural norms in agricultural communities, where men are traditionally regarded as the leading economic providers and are more engaged in physically demanding roles. As noted by Serandoma *et al.* (2024), men typically manage the operational aspects of farming, while women contribute in more supportive capacities, often overseeing care tasks or stepping in when male family members are absent. This gendered division of labour is consistent with the perspectives of Andarwati *et al.* (2023), who describe women's roles as complementary to men's responsibilities in farming households.

Formal Education

The educational profile of farmers in both ethnic groups is predominantly low, with 46% of Chinese and 44% of Malay farmers having completed only primary-level education. This limited formal education can restrict farmers' ability to access technical knowledge, adopt innovations, and respond effectively to market dynamics. These factors are essential for enhancing productivity and supporting business development. Low educational attainment may also hinder their capacity to interpret agricultural extension materials, operate modern tools, or engage in recordkeeping and financial planning.

This concern is echoed by Alamsyah *et al.* (2022), who found that in Bangka Belitung, farmers with minimal formal education often struggled to adopt improved livestock management practices and had reduced access to formal financial institutions. Such educational limitations not only affect individual farm performance but can also slow broader efforts in rural agricultural development and innovation diffusion. Therefore, strengthening farmers' access to informal learning opportunities through training, peer learning, or extension services could play a critical role in bridging this educational gap.

Farmers' Age

A substantial proportion of farmers belong to the productive age group, defined as individuals aged 15 to 64 years (BPS-Statistics, 2024), with 76% of Chinese and 94% of Malay farmers falling within this category. Although many are aged over 50, they remain within the productive age range,

indicating that they still possess the labor capacity and potential to adopt innovations in livestock farming. This age structure reflects a favorable demographic profile for sustaining current farming activities in the near term.

However, the dominance of older farmers also highlights a potential challenge for the sector's long-term sustainability. The low involvement of younger generations in agriculture raises concerns about generational renewal and the long-term sustainability of livestock farming as an economic livelihood. While economic viability is essential, the presence of young people in the household is just as crucial in determining whether or not a farm successor is identified (Loughrey *et al.*, 2025). Without a younger generation willing to continue farming, even profitable operations risk discontinuation. Addressing this issue will require targeted efforts to make agriculture more appealing to youth by improving access to land, modern technology, relevant training programs, and financial support mechanisms that can lower entry barriers and encourage long-term engagement in the sector.

Cattle Herd Size

In terms of cattle herd size, Chinese farmers predominantly keep 1–3 cattle (48%), while Malay farmers are more likely to own 4–10 cattle (48%). This indicates a difference in resource allocation and farming orientation. Malay farmers tend to pursue more commercially driven livestock operations, whereas Chinese farmers often view cattle farming as a supplementary or secondary activity. These differences reflect varying levels of investment, risk tolerance, and long-term commitment. Based on interviews and field observations, Malay farmers generally expressed stronger motivation to expand their herds and viewed cattle farming as a viable business, while Chinese farmers emphasized stability and income diversification. Ethnic variations in access to land, labor, and capital may further explain these differences. This pattern is consistent with Houessou *et al.* (2019), who noted that ethnic background influences livestock management objectives, shaped by broader livelihood strategies and cultural preferences.

Cattle Farming Experience

In Central Bangka, most beef cattle farmers have relatively limited experience in the sector. Among Chinese farmers, 92 percent have been engaged in cattle farming for 15 years or less, while a similar trend is observed among Malay farmers, with 94 percent falling into the same category. Only a small percentage of farmers have between 16 and 29 years of experience, at 2 percent for Chinese and 4 percent for Malays. Meanwhile, long-term experience of 30 years or more is reported by just 6 percent of Chinese and 2 percent of Malay farmers. These figures suggest that beef cattle farming remains a relatively new

livelihood activity for the majority of households in both ethnic groups.

Despite the limited duration of experience, this does not necessarily constrain productivity or farm performance. Antwi-Agyei and Stringer (2021) highlight that farmers with fewer years of experience can still operate effectively when supported by adequate training and extension services. Field observations indicate that many of these farmers, particularly those newer to cattle farming, tend to rely on informal knowledge sources such as advice from neighbors or family traditions. While this helps maintain basic operations, it often results in inconsistent management practices, particularly in areas such as feeding routines and animal health care. These findings emphasize the importance of structured agricultural extension services that offer reliable technical support and training. Improving access to such services is essential to enhance productivity, promote good farming practices, and support the long-term growth of the beef cattle sector in Central Bangka.

Land Status

Most cattle farmers from both ethnic groups raise livestock on land they own, 68% of Chinese and 96% of Malay respondents. Owning land provides farmers with the stability needed for long-term decision-making and supports investments in key infrastructure such as shelters, feed storage, and water systems. Farmers who own their land typically have greater autonomy in managing operations and are more likely to adopt sustainable practices, including improved waste management and forage cultivation. Field interviews further confirm that land-owning farmers tend to feel more secure and motivated to expand their businesses, as they face fewer land-use restrictions and disputes.

In contrast, those operating on borrowed or shared land often hesitate to make long-term improvements due to uncertainty about continued access. Previous studies have shown that land ownership significantly influences both productivity and technical efficiency, as it allows farmers to plan production more effectively, apply inputs consistently, and implement better farm management practices. Moreover, economic theory suggests that insecure land tenure can restrict access not only to land but also to credit and financial services, both of which are critical for adopting improved and sustainable farming methods (Koirala, 2016).

Land Size

Most respondents operate on relatively small landholdings, with 76% of Chinese and 72% of Malay farmers reporting limited land availability. These figures reflect the national context of smallholder farming, where plots under 0.5 hectares are standard (Purnawan *et al.*, 2020). In this study, land size is categorised into three levels: small (<0.5 ha), medium (0.5–1 ha), and large (>1

ha). This classification allows for a more detailed assessment of how land availability may influence cattle farming practices. Limited land can constrain herd expansion and necessitate more efficient land-use strategies, such as integrating forage production or rotational grazing (Robinson & Petrick, 2024).

Business Scale

The scale of cattle farming operations also differs: Chinese farmers are more likely to operate on a small scale (48%), whereas Malay farmers more commonly engage in medium-scale businesses (48%). For this study, business scale is categorised into small-scale (1–5 cattle), medium-scale (6–10 cattle), and large-scale (>10 cattle) operations (Mukhlis *et al.*, 2019). This classification helps capture the intensity and resource commitment involved in cattle farming. The variation between ethnic groups reflects distinct motivations and socioeconomic orientations. Chinese farmers may perceive cattle farming primarily as a diversification strategy aimed at generating short-term income, emphasizing economic gain, while Malay farmers tend to integrate cattle farming with cultural and religious motivations, promoting greater investment and herd expansion. This cultural contrast aligns with broader regional findings: financial incentives were stronger motivators among Chinese livestock stakeholders, whereas religious values significantly motivated Malaysian (largely Malay) livestock producers (Sinclair, 2019).

Livestock Ownership Status

Ownership structure varies as well, with livestock privately owned by 68% of Chinese and 96% of Malay farmers. This reflects a more individualistic model among Chinese farmers, who treat livestock primarily as economic assets. Conversely, livestock ownership among Malay farmers is often linked to social prestige and religious identity. Isbahi *et al.* (2024) suggest that in Malay communities, livestock ownership serves as a marker of social standing and community respect, beyond its economic function.

Livestock Rearing Pattern

Both ethnic groups predominantly adopt semi-intensive cattle farming systems, with 80% of Chinese and 96% of Malay farmers following this approach. This system offers a practical balance between resource efficiency and productivity, combining elements of free-range grazing with controlled feeding strategies. It is particularly well-suited to the land and labor limitations commonly found in Central Bangka. The use of pasture could be considered a positive management aspect for cow welfare as reported in other studies (Armbrrecht *et al.*, 2019; Schuppli *et al.*, 2014). Based on interviews and field observations, farmers often choose this method due to its flexibility and lower labor demands, allowing them to manage livestock while continuing other

occupations. The preference for semi-intensive practices also reflects a reliance on traditional knowledge and the need to adapt to limited infrastructure, rather than a strategic business choice driven by productivity optimization.

Market Access

Distinct marketing practices also emerge between the two groups. Chinese farmers primarily sell their cattle through middlemen (68%), while Malay farmers favour direct-to-consumer sales (70%). The reliance on middlemen among Chinese farmers may be attributed to their established business networks and efficiency in distributing marketing responsibilities. Fisman (2000) observed that Chinese traders often build extensive entrepreneurial linkages that reduce transaction costs. Meanwhile, Malay farmers' preference for direct sales is likely driven by the potential for higher margins, particularly during peak demand periods such as religious festivals.

Business Orientation

Finally, the majority of respondents consider cattle farming a secondary occupation, 72% of Chinese farmers and 54% of Malay farmers. Many of them are also engaged in other livelihoods such as trading, mining, or crop farming, which highlights the non-commercial and supplementary nature of smallholder livestock enterprises. Based on interviews and field observations, these businesses are often managed informally, with limited record-keeping, sporadic market engagement, and minimal reinvestment, suggesting that they lack full market integration. Instead of being driven by entrepreneurial ambition, such enterprises appear to be shaped more by tradition, cultural obligations, or economic necessity, serving as a form of income diversification or social security rather than a primary profit-oriented venture.

Sources of Capital

There is a noticeable difference in how each ethnic group finances its cattle farming activities. Chinese farmers tend to rely more on external funding sources, such as commercial loans or cooperative credit (56%), while 72% of Malay farmers primarily depend on personal

savings or financial support from family members. Differing socioeconomic backgrounds, risk perceptions, and cultural-religious considerations may influence this divergence. As noted by Zhang *et al.* (2006), Chinese communities often have a longer history of entrepreneurial activity and commercial engagement, making them more open to leveraging external capital for business ventures, including cattle farming. In contrast, many Malay farmers adhere closely to Islamic financial principles, which prohibit interest-bearing transactions (*riba*). This restriction limits their willingness to access conventional banking systems and encourages a preference for self-financing or interest-free loans obtained through informal social networks or community-based cooperatives. As Storz (1999) observed, Malay culture integrates Islamic values deeply into its practices, including economic decision-making. The tendency to avoid *riba*-based credit reflects not only compliance with religious teachings but also a broader pattern of financial behaviour that emphasises prudence, independence, and ethical conduct in managing economic activities.

Farmers' Motivation

The motivation of beef cattle farmers in Central Bangka Regency was assessed using the ERG (Existence, Relatedness, Growth) theory (Alderfer, 1969), which categorizes human needs into three hierarchical levels. This assessment was conducted using a total of 49 question items: 17 items related to existence needs, 15 items related to relatedness needs, and 17 items focused on growth needs. To determine each respondent's level of motivation, the score for each motivation type was calculated based on the total number of items multiplied by the Likert scale range (1 to 5). Thresholds for categorizing motivation levels into "high" or "low" were then established based on the maximum, minimum, and midpoint possible scores.

Table 3 presents the distribution of motivation categories across the two ethnic groups. All Malay farmers (100%) were classified as having high overall motivation, indicating strong internal drivers across existence, relatedness, and growth domains. This suggests that Malay farmers view cattle farming not only as a source of livelihood, but also as a meaningful social and personal activity.

Table 3. Motivation Categories of Ethnic Chinese and Malay Farmers

Ethnicity	Existence %		Relatedness %		Growth %		Motivation %	
	Low	High	Low	High	Low	High	Low	High
Malay	0	100	0	100	0	100	0	100
Chinese	44	56	22	78	12%	88	22	78

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In contrast, Chinese farmers showed varied levels across the three motivational components: 56% exhibited high motivation in the existence category, 78% in relatedness, and 88% in growth. When aggregated, 78% of Chinese farmers fell into the high motivation category overall, while the remaining 22% were classified as having low motivation. This disparity implies that although most Chinese farmers are strongly

motivated, particularly in areas of personal growth and social connection, a portion may lack strong foundational incentives, potentially due to their part-time engagement in cattle farming.

The high levels of motivation observed in both ethnic groups reinforce the findings of Octarini *et al.* (2022), who argue that strong work motivation is closely linked to increased productivity and the sustainability of farming enterprises. Farmers with

high motivation are generally more committed, innovative, and receptive to extension services, all of which are key factors in improving farm performance and long-term viability.

Existence Needs

Based on Table 4, the majority of Malay farmers view cattle farming not only as a source of income but also as a cultural and personal endeavor. About 100% (68% agree, 32% strongly agree) stated that cattle farming supports traditional customs. All respondents also acknowledged that the income helps meet basic

needs (48% agree, 52% strongly agree), such as food, clothing, and housing. However, only 36% believed their income was sufficient for a decent standard of living, while 48% disagreed, indicating persistent financial limitations. For secondary needs (e.g., vehicles, communication tools), responses were mixed: 58% agreed or strongly agreed, while 32% disagreed. Tertiary needs (e.g., investments or luxury goods) remained largely unmet, with 34% disagreeing and only 10% strongly agreeing. On the other hand, support for children's education was seen as achievable by 78% (32% agree, 46% strongly agree).

Table 4. Percentage of Questionnaire Responses on Existence Motivation

No	Statement	Existence					Malay (%)					Chinese (%)				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
1	Raising beef cattle enables me to support traditional cultural activities.	0	0	0	68	32	92	6	2	0	0					
2	I raise beef cattle to meet my basic needs (clothing, food, and housing).	0	0	0	48	52	10	28	4	36	22					
3	The income I earn from cattle farming allows me to provide a decent living for my family.	0	48	16	22	14	6	44	24	14	12					
4	Through beef cattle farming, I can afford secondary needs (such as a car, motorcycle, or mobile phone).	0	32	8	38	20	26	52	8	12	2					
5	Through beef cattle farming, I can fulfil tertiary needs (such as jewellery, hobbies, or investments).	4	34	14	38	10	26	42	8	18	6					
6	Raising beef cattle helps me meet my children's educational needs.	6	16	0	32	46	42	18	6	24	10					
7	I feel happy as a result of raising beef cattle.	0	0	0	18	82	0	2	14	32	52					
8	I feel financially secure through beef cattle farming.	0	0	0	12	88	2	4	12	48	34					
9	Raising beef cattle allows me to pursue a hobby.	0	0	0	16	84	4	10	4	26	56					
10	Raising beef cattle supports my religious needs.	0	0	0	18	82	84	12	2	0	2					
11	I believe my future is secure as long as I continue raising beef cattle.	0	0	0	10	90	8	6	30	22	34					
12	My cattle farming business is supported by the surrounding community.	0	0	0	16	84	2	2	2	42	52					
13	Through beef cattle farming, I can save for the future.	0	0	0	12	88	0	2	2	30	64					
14	My life feels more peaceful because of beef cattle farming.	0	0	0	12	88	0	10	16	34	40					
15	Raising beef cattle has made me feel more confident in facing life.	0	0	0	22	78	2	10	28	30	30					
16	Raising beef cattle allows me to provide a stable source of income to support my livelihood.	0	62	12	24	2	34	32	18	10	6					
17	Through beef cattle farming, I am able to continuously increase my income to meet daily needs.	0	20	20	42	18	44	28	10	12	6					

Notably, 82% of Malay farmers strongly agreed that cattle farming brings them happiness, and 88% felt financially secure. A significant proportion also reported that their hobby is fulfilled through cattle farming (84% strongly agree), and 82% believed that their religious needs were met through this occupation. Views on future security were overwhelmingly positive: 90% strongly agreed that cattle farming provided them with a secure future, and 88% reported having savings for future needs. Additionally, most Malay farmers felt a greater sense of peace (88% strongly agree), and 78% believed cattle farming enhanced their self-confidence. Despite these positive indicators, 62% of respondents disagreed that they had a stable income, even though 42% acknowledged that their income had increased over time. Overall, 86% strongly agreed that cattle farming had contributed to improving their well-being in a structured and meaningful way.

In contrast, most Chinese farmers did not associate cattle farming with traditional activities, as indicated by 92% strongly disagreeing with this notion. In terms of fulfilling basic needs, only 36% agreed and 22% strongly agreed that cattle farming supported their basic livelihood, while 28%

disagreed. Income sufficiency was also a concern; 44% disagreed that their earnings were adequate to meet family needs, and 24% remained undecided.

For secondary needs, such as acquiring vehicles or communication tools, 52% disagreed that their income was sufficient, and only 12% strongly agreed. Similarly, tertiary needs were difficult to fulfil, 42% disagreed that cattle farming supported investments or luxury purchases, and only 6% strongly agreed. With regard to children's education, only 24% agreed and 10% strongly agreed that their income could meet such expenses.

Nevertheless, 52% of Chinese farmers strongly agreed and 32% agreed that cattle farming made them feel happy. Financial security was acknowledged by 48% who agreed and 34% who strongly agreed. In terms of personal satisfaction, 56% strongly agreed that cattle farming aligned with their hobbies, though only 12% strongly agreed that it fulfilled religious obligations. Future security was somewhat more optimistic, with 34% strongly agreeing and 64% reporting savings. Additionally, 40% strongly agreed that their lives were more peaceful, while 30% agreed that cattle

farming increased their self-confidence. However, stability of income remained an issue: 34% disagreed that their income was stable, and 44% disagreed that their earnings continued to grow, with only 6% strongly agreeing to the latter. Nonetheless, 54% strongly agreed that cattle farming had positively impacted their well-being in a structured manner.

Understanding basic human needs is important for explaining human behavior and well-being (Ryan & Deci, 2000). According to Maslow's hierarchy of needs, people must first meet their basic needs, such as food, water, shelter, and sleep, before they can focus on higher-level needs like safety, belonging, self-esteem, and personal growth. If these basic needs are not met, it can lead to conflict. These survival needs also affect many areas of life, including work, relationships, and financial stability. The Existence Needs in Alderfer's ERG theory are roughly equal to Maslow's Physiological and Safety Needs, emphasizing the importance of survival and security (Acquah *et al.*, 2021). Meeting these needs is essential for people to live well and reach their full potential. Addressing them is key to supporting both individual and social well-being. The data indicate that while Malay farmers generally perceive cattle farming as a means to meet these fundamental needs, Chinese farmers show a more varied and cautious assessment, likely influenced by differences in cultural background, farming

orientation, and economic reliance on livestock activities.

Relatedness Needs

As shown in Table 5, most Malay beef cattle farmers perceive their cattle farming activities as a means of engaging in traditional or religious practices with family and friends. Specifically, 26% agreed and 74% strongly agreed that cattle farming supports family-related cultural or religious activities, while 22% agreed and 78% strongly agreed that it facilitates such activities with friends. Family support for their cattle farming business is particularly strong, with 86% strongly agreeing. Similarly, 86% of respondents strongly agreed that they receive support from neighbors, and 74% strongly agreed that cattle farming helps them maintain positive relationships with the surrounding community.

Social connectedness is further evidenced by the high percentage (94%) of Malay farmers who strongly agreed that they have friends who support each other in their cattle farming activities. An even higher percentage (98%) strongly agreed that cattle farming has helped them expand their social network. However, most do not view their involvement in cattle farming as a means to join formal livestock communities; 82% strongly disagreed with this statement.

Table 5. Percentage of Questionnaire Responses on Relatedness Motivation

No	Statement	Malay (%)					Chinese (%)				
		1	2	3	4	5	1	2	3	4	5
1	Raising beef cattle allows me to support traditional and religious activities with my family.	0	0	0	26	74	86	12	0	0	2
2	Raising beef cattle allows me to support traditional and religious activities with my friends.	0	0	0	22	78	86	12	0	0	2
3	My family supports me in raising beef cattle.	0	0	0	14	86	0	2	0	30	68
4	My neighbours support my cattle farming activities.	0	0	0	14	86	0	4	2	40	54
5	I have good relationships with my neighbours because of my cattle farming business.	0	0	0	26	74	0	2	4	42	52
6	I have friends who support each other in beef cattle farming.	0	0	0	6	94	0	2	0	12	86
7	Through cattle farming, I can expand my network and meet new people.	0	0	0	2	98	0	0	0	10	90
8	I raise beef cattle to be part of a local cattle farming community.	82	12	0	2	4	78	14	0	6	2
9	Cattle farming strengthens my sense of togetherness with others.	0	0	0	54	46	2	2	16	38	42
10	Through cattle farming, I feel I can contribute to community activities.	0	2	2	44	52	26	16	24	28	6
11	Through cattle farming, I am able to help those around me.	0	0	2	40	58	8	10	24	44	14
12	I collaborate with fellow group members in my cattle farming activities.	2	2	0	74	22	22	8	2	46	22
13	I work with business partners (traders, feed suppliers, or butchers) to run my cattle business.	52	34	0	8	6	92	4	0	2	2
14	I collaborate with agricultural extension workers or animal health workers.	0	0	0	4	96	0	0	0	4	96
15	Through cattle farming, I am able to work with bank officials to access capital.	98	0	0	0	2	98	0	0	2	0

In terms of general social interaction, 54% agreed and 46% strongly agreed that cattle farming has improved their social engagement. Additionally, 52% strongly agreed that their cattle farming activities make them feel involved in community activities, and 58% strongly agreed that their business enables them to help others in their local area. The sense of collaboration is also visible in their relationships with fellow farmers; 74%

agreed that they can work together within farmer groups. However, cooperation with other value chain actors is limited. Only 8% agreed and 6% strongly agreed that they collaborate with traders or feed suppliers, while 52% strongly disagreed. On the other hand, collaboration with agricultural extension workers or animal health workers is notably strong, with 96% strongly agreeing. Access to financial institutions remains a significant barrier;

98% strongly disagreed that they can collaborate with banks for capital access.

In contrast to their Malay counterparts, the majority of Chinese farmers do not associate cattle farming with traditional or religious activities, as reflected by 86% who strongly disagreed with such statements in relation to both family and community practices. Nonetheless, family, and neighbourly support remains strong: 68% strongly agreed that their families support their cattle farming activities, and 54% strongly agreed that they also receive encouragement from neighbors. Additionally, 52% strongly agreed that cattle farming helps them build positive relationships with the surrounding community.

Social support among peers is notably high, with 86% strongly agreeing that they have friends who support each other in cattle farming, and 90% strongly agreeing that cattle farming helps expand their social networks. However, despite these interpersonal connections, 78% strongly disagreed that they raise cattle, intending to join formal livestock communities. While 42% strongly agreed that cattle farming enhances their sense of togetherness, only 6% strongly agreed that it allows them to contribute to community activities, and just 14% strongly agreed that their business enables them to help others in their environment.

Regarding collaborative practices, 46% agreed that they can work within farmer groups. However, their cooperation with external stakeholders remains minimal: 92% strongly disagreed that they collaborate with traders or feed suppliers. Interaction with agricultural extension agents and animal health workers mirrors that of Malay farmers, with 96% strongly agreeing that such engagement occurs. Nonetheless, financial integration remains a challenge, as 98% strongly disagreed that they can access capital through cooperation with banks.

These findings align with Baumeister and Leary's (2017) assertion that the need for relatedness reflects a fundamental human motivation to form and maintain meaningful social relationships, both in personal contexts and in the workplace. Socio-cultural dimensions also play a vital role in building resilient and cohesive communities (Haryadi *et al.*, 2016). In this context, cattle farming serves as more than just an economic activity; it fosters social connection by encouraging shared goals, cooperation, and mutual learning among farmers (Wynne-Jones, 2017). Farmer groups are essential in this process, functioning as platforms for interaction and dissemination of accurate information and best practices (Syihabuddin *et al.*, 2025). Their effectiveness is often supported by the involvement of agricultural extension and animal health workers, who act as facilitators and catalysts for group development and innovation adoption. Through regular interaction, agricultural extension services equip farmers with essential knowledge and practical guidance, enabling them to better understand and apply technological advancements

in their farming practices (Andarwati *et al.*, 2025). Overall, both Malay and Chinese farmers fulfill relatedness needs through cattle farming, though in varying degrees and forms, highlighting the importance of culturally sensitive approaches in supporting social cohesion and collective action in rural development.

Growth Needs

According to Table 6, the majority of Malay farmers perceive that their cattle farming business significantly enhances their family's well-being, with 100% strongly agreeing. All respondents also strongly agree that engaging in beef cattle farming provides them with new knowledge. Regarding social recognition, 54% strongly agree and 34% agree that their involvement in cattle farming has increased their social respect. However, leadership opportunities within farmer groups appear limited; only 16% agree and 20% strongly agree they have had such opportunities, while 38% disagree.

In terms of family pride, 68% of Malay farmers strongly agree and 32% agree that they feel appreciated by their families for their cattle farming activities. Furthermore, 86% strongly agree that their quality of life has improved after engaging in beef cattle farming. Some farmers also perceive a contribution to community welfare; 36% strongly agree and 22% agree that they help generate employment, although 22% strongly disagree.

Spirituality also plays a role, with 34% strongly agreeing and 64% agreeing that cattle farming enhances their spiritual lives. Regarding life aspirations, 68% strongly agree that cattle farming helps them achieve life goals, and 86% strongly agree that it offers opportunities for continuous learning. Additionally, 58% strongly agree that cattle farming enables them to provide better education for their children.

Motivation and purpose are also strongly felt, with 80% strongly agreeing that cattle farming helps them aspire to greater goals and provides a stronger sense of purpose in life. In terms of financial planning, 86% strongly agree that their cattle farming business helps them make plans to improve their family's welfare. A total of 60% strongly agree that it boosts their desire for better housing, while 80% believe their lives are more structured due to their involvement in cattle farming. In contrast, Chinese farmers show slightly lower levels of growth need fulfilment. While 74% strongly agree and 24% agree that cattle farming improves family well-being, only 88% strongly agree that the business contributes to their knowledge. As for social recognition, just 20% strongly agree that they are more respected, with 38% unsure and 10% strongly disagreeing.

Opportunities to become group leaders are even less perceived, with only 4% strongly agreeing and 40% agreeing, while 22% disagree. Nevertheless, feelings of family pride remain high, with 46% strongly agreeing and 48% agreeing that their family appreciates their involvement in cattle

farming. Meanwhile, 44% strongly agree that their lives have improved since entering the cattle business.

However, their perceived contribution to community job creation is limited, with only 6% strongly agreeing and 80% strongly disagreeing. Regarding spirituality, only 4% strongly agree that

cattle farming has improved their spiritual lives, while 66% strongly disagree. In terms of personal growth, 38% strongly agree that cattle farming supports them in achieving life goals, and 76% strongly agree that it allows them to learn new things.

Table 6. Percentage of Questionnaire Responses on Growth Motivation

Growth		Malay (%)					Chinese (%)				
No	Statement	1	2	3	4	5	1	2	3	4	5
1	I raise beef cattle to improve the well-being of my family.	0	0	0	0	100	0	0	2	24	74
2	I raise beef cattle to gain new knowledge.	0	0	0	0	100	0	0	2	10	88
3	Raising beef cattle makes me feel more respected by the community.	2	0	10	34	54	6	10	38	26	20
4	Through beef cattle farming, I have the opportunity to become a group leader or committee member.	10	38	16	16	20	20	22	14	40	4
5	My family is proud of me because of my involvement in beef cattle farming.	0	0	0	32	68	2	2	2	48	46
6	My life has improved as a result of raising beef cattle.	0	0	0	14	86	4	4	16	32	44
7	By raising beef cattle, I feel I help create job opportunities in my community.	22	16	4	22	36	80	8	2	4	6
8	I have grown spiritually through my experience in cattle farming.	0	2	0	64	34	66	12	2	16	4
9	Cattle farming helps me achieve my life goals.	0	0	0	32	68	8	6	14	34	38
10	Raising beef cattle gives me the opportunity to learn new things.	0	0	0	14	86	0	0	0	24	76
11	Through cattle farming, I can provide better education for my children.	6	8	0	28	58	26	20	10	24	20
12	Cattle farming gives me greater aspirations in life.	0	0	0	20	80	4	10	10	36	40
13	My entrepreneurial motivation has increased through beef cattle farming.	0	0	2	24	74	6	12	4	30	48
14	Raising beef cattle gives me a strong sense of life purpose.	0	0	0	20	80	4	10	2	48	36
15	Through cattle farming, I am able to plan for my family's welfare.	0	0	0	14	86	2	4	6	34	54
16	Raising beef cattle motivates me to have a more decent place to live.	0	8	2	30	60	26	22	10	16	26
17	Cattle farming has helped me build a more structured and purposeful life.	0	0	0	20	80	4	2	4	36	54

Only 20% of Chinese farmers strongly agree that cattle farming helps them provide better education for their children. In relation to motivation and aspirations, 40% strongly agree that cattle farming encourages them to strive for greater achievements, and 48% strongly agree that it enhances their entrepreneurial drive. Just 36% strongly agree that cattle farming gives them a stronger sense of purpose in life.

Financial planning and structure also appear less prominent among Chinese farmers. Only 54% strongly agree that cattle farming helps them make plans to improve their family's welfare, and just 26% strongly agree that it increases their desire to have better housing. Nonetheless, 54% strongly agree that cattle farming contributes to a more structured life. According to Ryan & Deci (2000) and Prisniakova *et al.* (2023), growth needs reflect the human desire for personal development and self-esteem, encompassing the pursuit of learning, achievement, independence, and the realisation of one's full potential. The motivational pattern in cattle farming observed in this study aligns with Alderfer's ERG theory (Alderfer, 1969), which posits that need satisfaction is not necessarily hierarchical. Instead, multiple needs can be fulfilled simultaneously. Among Malay farmers, growth, relatedness, and existence needs appear to be met concurrently. Conversely,

Chinese farmers tend to fulfil these needs sequentially, starting with existence, followed by relatedness, and then growth reflecting a progressive satisfaction process.

Hypothesis Testing

This study aims to identify the factors influencing beef cattle farmers' motivation using a Multiple Linear Regression (MLR) approach. The unit of analysis is the individual beef cattle farmer in Pangkalan Baru District, Central Bangka Regency. The dependent variable (*Y*) in this study is motivation, while the independent variables include age (*X*₁), formal education (*X*₂), cattle farming experience (*X*₃), land size (*X*₄), cattle herd size (*X*₅), ethnicity (*X*₆), error (*ε*).

The F-test analysis (Table 7) reveals that the independent variables collectively have a significant effect on motivation (*p* < 0.05). The t-test results, as shown in Table 8, indicate the influence of these variables on the motivation of Chinese and Malay ethnic farmers. The corresponding regression equation is as follows:

$$Y = 316.908 + 1,290X_3 + 1,296X_5 + 94,436X_6 + 23.359$$

Table 7. Multiple Linear Regression Analysis (F-test)

Parameter	Sum of Squares	df	Mean Square	F	Sig.
Regression	249034.751	6	41505.792		
Residual	105767.039	93	1137.280	36.496	.000 ^b
Total	354801.790	99			

a. Dependent Variable: Motivation

b. Predictors: (Constant), Age, Formal Education, Cattle Farming Experience, Land Size, Cattle Herd Size, Ethnicity

Table 8. Multiple Linear Regression Analysis (t-test)

Variable	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	316.908	23.359		13.567	.000
Age (X_1)	-.199	.342	-.038	-.581	.562
Formal education (X_2)	1.133	1.143	.061	.991	.324
Cattle farming experience (X_3)	1.290	.476	.177	2.711	.008**
Land size (X_4)	-.001	.002	-.019	-.323	.747
Cattle herd size (X_5)	1.296	.596	.139	2.175	.032**
Ethnicity (X_6)	94.436	6.927	.793	13.633	.000***

a. Dependent Variable: Motivation

b. Description : *=10% significance; **=5% significance; ***=1% significance

The variables that significantly affect motivation in beef cattle farming include cattle farming experience (X_3), cattle herd size (X_5) and ethnicity (X_6). The Standard Error of the Estimate, reported as 23.359, reflects the average distance that the observed values fall from the regression line. In practical terms, it suggests that the predicted motivation scores may deviate from the actual scores by approximately 23.359 units on

average, indicating a moderate level of prediction accuracy within the model. The adjusted R^2 as presented in Table 9 has a coefficient value of 0.683, indicating that 68.3% of the variation in farmers' motivation can be explained by the variables examined, including capital, market conditions, age, education, experience, land area, and cattle herd size. The remaining 29.7% is attributed to other unobserved factors not included in the study.

Table 9. Determination coefficient of the research model

Model Summary				
Model	R	R-Square	Adjusted R-Square	Std. Error of the Estimate
1	.838 ^a	.702	.683	33.72358

^aPredictors: (Constant), Age, Formal Education, Cattle Farming Experience, Land Size, Cattle Herd Size, Ethnicity

Cattle farming experience (X_3) was found to have a significant and positive influence on farmers' motivation ($p < 0.05$). The regression coefficient shows that each additional year of experience contributes an increase of 1.290 points to the motivation score. This finding confirms that experience directly enhances a farmer's motivational level in running and developing their cattle business. Experienced farmers are generally more confident in their capabilities, better equipped to face challenges, and more strategic in their planning and resource use, which collectively strengthen their commitment to livestock farming. Thus, the longer a farmer has been engaged in cattle farming, the higher their motivation to sustain and grow their business. Similar conclusions were drawn by Baharuddin *et al.* (2024), who emphasized that farmers with more experience tend to be more motivated due to their accumulated knowledge and problem-solving abilities. Likewise, Andarwati *et al.* (2018) highlighted that experience plays a crucial role in building the confidence and business acumen necessary for long-term success in livestock enterprises.

Cattle herd size (X_5) also showed a statistically significant influence on farmers' motivation ($p < 0.05$). The analysis revealed that each additional head of cattle contributes to an increase of 1.296 points in the motivation score. This result indicates that larger-scale cattle ownership boosts farmers' motivation to improve, innovate, and expand their operations. Owning more cattle often reflects a higher level of investment, responsibility, and business ambition, which in turn intensifies a farmer's motivation to manage the business efficiently. In this context, herd size not only represents a physical asset but also acts as a motivational driver that pushes farmers to pursue better outcomes. According to Andarwati *et al.* (2018), herd size symbolizes both success and challenge, prompting farmers to remain active, competitive, and forward-thinking in their livestock businesses.

Ethnicity (X_6) significantly influenced the dependent variable, farmers' motivation, at the 1% significance level ($p < 0.01$). The regression coefficient indicates that Malay farmers had a motivation score 94.436 points higher than Chinese farmers. This substantial difference

underlines the importance of ethnic background as a determining factor in shaping the motivation level of beef cattle farmers. Cultural values, beliefs, and historical connections to farming influence how different ethnic groups perceive livestock activities and the extent to which they engage with them. For Malay farmers, motivation may be rooted in strong social and cultural traditions surrounding cattle ownership, as well as communal support systems that encourage farming as a livelihood. In contrast, Chinese farmers may prioritize other types of business or investments, leading to different motivational drivers. These findings reinforce the notion that motivation is not solely an individual psychological trait, but also a socially and culturally embedded outcome. Inwood (2013) emphasized that cultural identity shapes how farmers make agricultural decisions, and Haryadi *et al.* (2016) stressed the importance of aligning development programs with socio-cultural realities to enhance farmer motivation effectively. Othman *et al.* (2019) also noted that ethnic diversity must be considered when assessing differences in farming motivation, as values, goals, and work ethics often vary significantly between groups.

Conclusion

This study reveals clear differences in business characteristics and motivational levels between Malay and Chinese beef cattle farmers in Central Bangka Regency. Malay farmers generally operate at a medium scale, use personal capital, and sell cattle directly to the market, while Chinese farmers tend to manage smaller-scale operations, rely on external capital, and access markets through middlemen. Although both ethnic groups demonstrate high motivation to engage in beef cattle farming, Malay farmers show significantly higher motivation across all dimensions of the ERG (Existence, Relatedness, and Growth) framework, with a score of 100%, compared to 78% among Chinese farmers.

Statistical analysis using multiple linear regression confirms that cattle farming experience, herd size and ethnicity significantly and positively influence farmers' motivation. Malay ethnicity is associated with stronger cultural and social drivers that enhance motivation. Furthermore, greater farming experience increases motivation, as farmers acquire practical knowledge, confidence, and commitment over time. Likewise, larger herd sizes strengthen motivation by reflecting economic investment and encouraging business expansion.

Based on these findings, policy interventions aimed at enhancing farmer motivation should consider ethnic-specific socio-cultural contexts, particularly in designing empowerment programs for Chinese farmers, who have relatively low motivation levels. Capacity-building initiatives such as training, mentoring, and experience-sharing between ethnic groups can be effective in improving motivation, especially for less experienced and small-scale farmers. Additionally,

facilitating access to market information, direct market linkages, and capital support for Chinese farmers could enhance their business scale and motivation. Overall, development programs should be tailored not only to economic factors but also to cultural identities, ensuring more inclusive and effective support for livestock farming in the region.

Conflict of interest

No conflict of interest was declared.

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Author's contribution

The first author was responsible for the conception, methodology, data analysis, data collection, and original manuscript writing. The second author contributed to the conception, methodology, validation, and manuscript review/revision. The third author was involved in translation, data analysis and manuscript review/revision. The fourth author was involved in the conception, methodology, validation, and manuscript review/revision. All authors read and approved the final version of the manuscript.

Ethics approval

This study did not require formal ethics approval as it did not involve human participants or animals.

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