Sustainable Value Chain Innovation for strengthening The Indonesian Halal Beef Industry

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Halal Meat,
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Abstract
This study aims to examine the product, process, and business model value innovation of halal beef in Indonesia. This study uses quantitative and qualitative data. Through purpose sampling, the survey involved 425 middle-class Muslim consumers, 100 beef retailers, 25 beef processors, and 100 mid-to-large-scale cattle farmers. It finds that product value innovation steer halal beef producers and suppliers should eliminate the fat content of halal beef. Suppliers should reduce their focus on the attributes of size, grade, taste, nutritional value, production origin, beef availability, packaging, shopping location, display in the shop, ease of preparation, traceability, price, and the presence of a Muslim shop owner. Instead, they should improve the attributes of newness, appearance, halal labels, texture, aroma, hygiene, and residue free. They should create online services and ensure halal certification of their stores. Meanwhile, process value innovation should take the form of beef producers eliminating aging and deboning activities. In essence, Each actor should keep doing the same activities but also take more seriously how their activities impact values and emissions. Cattle farmers should improve cattle feed management to earn higher, and beef retailers should create online services for their customers. Furthermore, business model value innovation should change relationship patterns from collaborative transactions to collaborative processes. Digital resources can be used as new distribution channels and online services. Finally, business model value innovation will shift from the red ocean to the blue ocean competition.

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1. Introduction

Food is critical to Indonesian consumers' lives against solid adherence to Islamic principles. Compliance with halal food is very robust. A 2017 survey of 2,909 Muslim consumers in Indonesia, carried out by Jakpak (2017), found that 92.7% of consumers would look specifically for a halal label before purchasing food products.

One of the key halal food products in Indonesia is beef, which Muslims require to be halal (Mahbubi *et al.*, 2019). Halal beef is the most important source of animal protein in Indonesia, behind halal chicken and fish (Meat & Livestock Australia (2018). Meat & Livestock Australia (2018) also state that Indonesian Muslim consumers choose beef because they consider it superior, a favorite ingredient for many meals, versatile, and having consistent quality standards. Indonesian Muslims' halal beef consumption increased from 506,529 tons in 2007 to 711,885 tons in 2022. Interestingly, beef consumption far exceeds the national beef production, which stood at 339,480 tons in 2007 and 498,923 tons in 2022. Data show the trading of halal beef in Indonesia has sustained a deficit of more than 100,000 tons per year for the last fifteen years (Ministry of Agriculture of the Republic of Indonesia, 2022).

On the other hand, halal beef supply in Indonesia comes from various provinces and islands. Each region has its own halal beef distribution flow, characterized by the distribution between provinces and islands from surplus to deficit areas. There are differences in margin levels between farmers and beef processors from surplus-producing regions, such as South Sulawesi province, who trade at the local and interprovincial levels. The margins for farmers in the local market is more than 40%, while a farmer's margin in the inter-island market is less than 30% (IPB University, 2013). This can lead farmers and beef processors to be unwilling to sell halal beef out of the province. This means that the amount of halal beef distributed from surplus to deficit areas is relatively small compared to the existing potential.

The other challenge facing halal beef distribution in Indonesia is halal assurance along the entirety of the beef value chain. According to Yamauchi and Okawa (2013), the whole supply chain must be halal in its material and processes, including animal processing, transporting, and displaying. Maman et al. (2018) show the nine halal-critical points in the Indonesian beef chain from farm to fork: animal welfare, stunning, type of knife, butchers, method of slaughter, religious invocation, deboning, packing and labeling, displaying, and cooking. Halal beef processing is the highest critical point along the beef chain.

Furthermore, the product's halalness should also observe the sustainability of both high economic value-added, high social impact, and low environmental impact. Mahbubi *et al*. (2020) find that farmers incur the highest costs but make the lowest profits along the Indonesian halal beef supply chain. Khan *et al*. (2018) and Haleem et al. (2020) explain that halal values along the supply chain require

implementing fair trade, being environment-friendly, ensuring animal rights, and resolving ethical issues. Fairtrade, eco-friendly, and animal welfare are the critical determinants beyond the halal and quality assurance components in the sustainable halal meat industry.

Strengthening the Indonesian halal beef industry requires a value chain approach to provide higher assurances to Muslim consumers as well as to protect halal brands. Optimization of halal value chains needs innovative solutions that exploit collaboration, both vertically with supply chain partners and horizontally among companies in the same industry. Therefore, enhancing collaborative innovation is crucial for the Indonesian halal beef Industry.

Until now, halal studies only focus on halal meat production and consumption as well as the halal supply chain. According to Mahbubi (2021), there are about 25 international journal articles concerning the halal concept and principles per year, around eight articles per year on halal production and consumption, and around ten articles on the halal supply chain per year. In contrast, the halal value chain is rarely explored. Moreover, topics of sustainable value chains, collaborative innovation, and value innovation is not yet utilized in halal studies. Therefore, halal studies should shift from halal knowledge to halal innovation. Halal innovation is beneficial to enhance consumer value and capture the blue ocean in the Indonesian halal Industry. Specifically, in halal beef studies, Mahbubi *et al*. (2019) reported that Indonesian Muslim consumers consider halalness in purchasing beef. Mahbubi et al. (2020) also found that the Indonesian halal beef supply chain is fragile in its sustainability and lacks collaborative relationships between actors.

For this study, the author aims to create sustainable value chain innovation. Mainly. This study aims to compose product value innovation, process value innovation, and business model value innovation for halal beef in Indonesia.

The structure of this paper is as follows. The second section contains a literature review. The third section explains the methodology, including the research design, data collection, and analysis. This paper's fourth section describes the results and discusses Indonesia's halal beef sector's innovation in outputs, processes, and business models. Finally, the fifth section contains the conclusion and implications for future study.

2. Literature Review

2.1. Halal supply chain and halal value chain

Tieman (2011 and 2020) states that the understanding of what is halal is going through an evolution over four phases: a Muslim-owned company, a halal product through halal process at the factory, a halal supply chain, and a halal value chain. In a Muslim company, the halal assurance system is based on trust. For a halal product, the halal assurance system is based on product certification by an independent halal

certification body. Halal assurance is extended upstream in the halal supply chain (addressing transportation and storage requirements of purchased ingredients) and downstream (addressing the supply chain's transportation, storage, and value-added needs). According to the halal value chain perspective, a company should apply Islamic values to its entire business value chain. Among others components, this covers the adoption of Islamic financing and takaful (Islamic insurance) as well as the use of Islamic branding and marketing concepts to position products to create value for the community and the earth (such as by minimizing waste along the chain).

A halal supply chain exists when each actor produces and distributes products with the halal principles implemented in each stage of the chain (Yusoff *et al*. 2015). Having a halal meat supply chain is a quality assurance system in the halal meat chain (Bonne and Verbekke, 2008), as it involves managing halal meat products from farm to fork and from different suppliers to various consumers in other places (Zulfakar *et al*. 2018; Ab Talib *et al*. 2015). Halal supply chains are complex for multiple reasons. First, there are different halal market requirements based on the Islamic school of thought, local fatwa (religious rulings), and local customs. There are a variety of interpretations of the slaughtering requirements regarding stunning and machine slaughter. Second, even though supply chain partners are based in different halal environments, there is a single global supply chain involving both Muslim and non-Muslim countries. Third, there is a poor understanding of halal itself and the requirement of halal logistics, particularly in non-Muslim countries d (Tieman, 2011). There is now also the opportunity to integrate digital oversight; for example, Ali *et al*. (2021) suggest that the blockchain framework might be appropriate to trace and maintain halal integrity along the supply chain.

Porter (1985) introduced the value chain approach to prioritize consumers in the supply chain from production to product distribution. The value chain focuses on delivering value to customers, particularly end consumers (Bonney *et al*. 2007). The critical point of the value chain is the end consumer value, which puts forward products made and provided based on consumer preferences. Tieman (2011) adopted this approach for halal studies. Based on the above definition, the halal value chain is each actor in the halal supply chain who produces or distributes halal products and refers to the end consumer value, taking into account the value transmission of each actor along the supply chain. Tieman (2020) further defines the halal value chain as occurring when the entire corporate value chain internalizes Islamic values. However, Antonio et al. (2020) find that halal value chain studies are still rare.

2.2. Sustainable value chain

Khan *et al*. (2018) explain that halal values along the food chain beyond halalness and tayyib require sustainability, including fair trade, environmentally friendly,

animal rights, and ethical issues. Haleem *et al.* (2021) argued that companies producing halal products should be tayyib, which requires sustainability practices. Khan *et al*. (2022) agree that the halal food chain is closely related to sustainability. According to Fearne (2009), sustainable value chains are collaborative relationships within value chain actors involving the adequate flow of information for rational decision-making and effective resource allocation, benefitting all actors in the value chain. Value chains can be sustainable if all actors are in tune with and responsive to customer's needs and wants, as well as the complex interaction between what actors do, how they do it, and the natural environment within which they operate. Soosay *et al*. (2012) developed a sustainable value chain framework for sustainable value chain analysis (SVCA) encompassing economic, environmental, and social impacts, managed through a collaborative model. Monastyrnaya *et al*. (2017) argue that sustainable value chains have a synergistic effect on value chain actors' contributions who have a willingness and vision to achieve sustainability by sharing a strategy, while Balázs *et al*. (2021) identifies three pathways for sustainable value chain studies, involving co-benefits (ecology), implementation (policy), and actors (society).

The sharing economy provides an ideal perspective for sustainable development (Daunoriene *et al*., 2015), as it has the potential to solve many social inequality and environmental issues (Rong *et al*., 2018). Therefore, it is essential to assess economic performance in the value chain. M4P (2008) evaluate the value chain financial performance based on the distribution of investments, costs, revenues, margins, and net profits among actors in a value chain, enabling users to determine an actor's financial position relative to other actors in the value chain. Meanwhile, Neto *et al*. (2018) developed an environmental and economic sustainability assessment using the activity-based costing approach.

Environmental sustainability has transformed the environmental landscape in terms of reducing energy consumption and preventing natural resource depletion (Wong and Zhou, 2015). In the context of beef production, environmental sustainability assessments must cover greenhouse gas emissions and water use (Thoma *et al*. 2017). Their study found that cattle farms creates the highest carbon and water use footprints along the beef value chain.

For social sustainability, the assessment utilizes a social life cycle assessment (SLCA). SLCA is a framework to assess social impacts on workers, local communities, value chain partners, and society throughout the products or services life cycle from all actors along the value chain (Pelletier, 2018). SLCA consists of social life cycle inventory and social life cycle impact assessment (Iribarren *et al*., 2022). In addition, the social assessment scope could cover the actual performance and potential impacts (Mattila *et al*., 2018), as well as implications based on employment quality and quantity (Gathorne-Hardy *et al*., 2016).

Finally, Lacoste (2016) adds the aspect of ethics to the sustainability dimension.

Ethics in this context are related to relationship management, particularly business-to-business vertical relationships. The ethics of a relationship thus become the fourth dimension of sustainability, as the sustainable value chain must have strong relationships between partners throughout the entire chain. Therefore, assessing the relationship helps ensure collaborative relationships with all actors in the value chain.

2.3. Value Innovation

Kim and Mauborgne (1997) introduced the concept of value innovation, making irrelevant competition shift from the red ocean (competing in existing market spaces) to the blue ocean (creating uncontested market spaces). Value innovation creates new markets and re-creates the existing markets. Kim and Mauborgne (1999) state that value innovation is the basis of the blue ocean strategy with a successful blue ocean shift occuring when new buyer value is created by opening new cost value fronts. Value innovation ties innovation to the value a product or service provides buyers. Kim and Mauborgne (2017) argue that value innovation goes beyond just technological innovation and comprises four-element: eliminate, reduce, raise, and create. Value innovation provides mutual value (Kleber et al., 2021).

The main goal of value innovation is to solve the main problems of consumers (Malodia *et al*., 2020). Matthyssens *et al*. (2006) state that value innovation initiative seeks to break out of traditional product thinking and emphasizes concepts oriented to adding value in business process managements or application specificity. Business model innovation changes the company's value proposition and reconfigures the stakeholder's networking in value creation and transmission (Short et al. 2013). Successful value innovation should be firmly embedded in a company's network relationships (Matthyssens *et al*., 2006); it implies the cooperation and commitment of external parties.

The multi-staged innovation process highlights the input-activity-output aspect (De Massis *et al*., 2013). The input stage observes resource allocation, while the activity stage involves creation process (Lumpkin *et al*., 2011). The final output stage covers the form of products or services delivered (Crossan & Apaydin, 2010). Röd (2016) developed this multi-staged innovation approach to analyze the innovation process at the firm level. This description shows that value innovation in the value chain should be developed based on the input, process, output aspects, and can be used to reconfigure a business model to become more sustainable (Shakeel *et al*., 2020).

3. Methodology

3.1. Research Design

The design of this study is a mixed-method descriptive type that describes value innovation on three-levels: output value innovation, process value innovation, and business model innovation. Output value innovation provides the consumer value proposition, referring to intrinsic and extrinsic consumer preference. Process value innovation refers to improving various activities that consider sustainability to enhance the value proposition. Finally, business model innovation develops a new structure and mechanism to provide value to the consumer.

3.2. Data collection

The study uses quantitative and qualitative data. Quantitative data are derived from exploring consumer preferences, while qualitative data are obtained from assessing the value chain. The data collection method utilizes consumer interviews through structured questionnaires with a five-point Likert scale, where five is very important, four is important, three is neutral, two is unimportant, and one is unimportant. The data collection method also utilizes semi-structured interviews with open-ended questions. Survey respondents are middle-class Muslim consumers, halal meat retailers, halal meat processors, and cattle farmers in Indonesia.

The majority of 425 participants in the consumer survey were majority female (78%), 74% were in the most productive age group of 30-49 years (74%), more than half were graduates of senior high school (56%), and most respondents had small families (50%) comprising three or four members. More than 40 percent of the respondents consume beef once a month. Indonesia's average yearly beef consumption is 2.5 kg per person; respondents purchase less than one kilogram of beef per shopping trip, with half of the respondents spending between IDR 120,000 and 240,000 (US$ 8.50-17) on beef each month. The majority of consumers purchase beef in wet markets rather than supermarkets.

Other respondents comprise 100 cattle farmers, 25 producers, and 100 retailers. The cattle farmer's participants are medium-scale farmers with between five and 50 cattle and large-scale cattle farmers with over 50 cattle. The beef producers are live cattle traders or middle-to-large-scale beef traders who routinely slaughtered cattle at halal-certified abattoirs. Finally, the beef retailer traded halal beef in volumes of between one and six tons per month. The qualitative sample is not determined primarily via representativeness but through conceptual requirements (Moser & Korstjens, 2019).

3.3. Sampling Technique

1. Consumer Survey

An intercept survey was conducted in ten of Indonesia's major cities: Jakarta, Bandung, Surabaya, Semarang, Denpasar, Kupang, Makassar, Pontianak, Lampung, and Medan. These cities are the Indonesia's most populous cities and have the highest halal beef consumption (Ministry of Agriculture, the Republic of Indonesia, 2022). The respondents were spread across 215 RT (city neighborhoods) from 43 villages.

The procedure for selecting a respondent is multi-stage random sampling as follows:

- Villages were randomly selected from a pre-determined proportional sampling. The researcher collects a list of the villages in the cities and assigns a code number for each village. Then, the researcher writes the numbers on small pieces of paper, puts it a tin, and draws pieces. The drawn number shows the village selected as the interview target.
- Five RT (the smallest formal institution in Indonesia) in each village were randomly selected. The researcher collects a list of the RT in the village and provides a code number for each RT. The selection process is theee same (using a tin) as for villages.
- Determining two middle-class Muslim households in each RT randomly selected by the drawing mechanism as the previous stage. The researcher collects a list of the middle-class Muslim households in the RT and provides a code number for each middle-class Muslim households, then uses the same method as above.

2. Value chain actor survey

The procedure for selecting a respondent is purposive sampling as follows:

- Determine the abattoir as the main actors who should be interviewed first. The abattoirs are the main gate of this value chain survey. The key requirement is that, the abattoirs hold a halal certification.
- Based on the information from the abattoirs, the researcher maps various actors, both suppliers (cattle wholesalers) and consumers (retailers)
- Interview cattle wholesalers that slaughter at the abattoirs and distribute the halal beef to retailers in the consumer survey area. Then, researchers interview halal beef retailers. The researcher also asks them about cattle suppliers. Finally, the researcher interviews the cattle supplier, who generally live in different cities. For example, the cattle farmers live in Bogor, Bekasi, and Tangerang, while the abattoir and wholesalers live in Jakarta.

3.3. Data analysis

1. Quantitative analysis for output value innovation

This study utilized importance-performance analysis (IPA) to determine the output value innovation. This statistical method aims to compare between the importance and performance levels of the consumer preference attribute. According to Martilla and James (1977), the IPA analysis results are grouped into quadrants on the importance-performance matrix map (figure 1). Quadrant A ("concentrate here") is considered important by customers, but in reality, these factors are not by customer expectations and the level of satisfaction obtained is still low. The variables in this quadrant should be increased. Quadrant B ("Keep up the good work") contains factors that are considered important by the customer and are in line with expectations so that the level of satisfaction is relatively higher. This quadrant's variables must be maintained because all these variables make products or services superior in the customer's eyes. Quadrant C ("Low priority") contains factors that are considered less important by customers, and the performance is not that special. The increase in the variables included in this quadrant can be reconsidered because the effect on the benefits for customers is minimal. Finally, quadrant D ("Possible overkill") comprises factors considered less important by customers, and are therefore excessive.

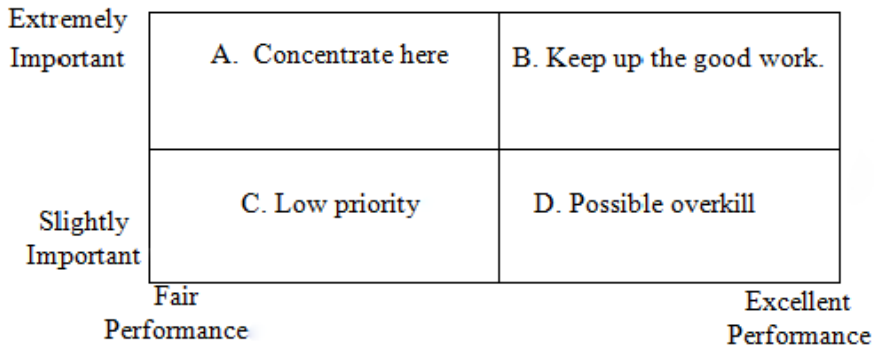


Figure 1. Importance Performance Quadrants
Source: Martilla and James (1977)

IPA helps evaluate consumer acceptance and enhance value innovation. This analysis determines what attributes to measure, separating the importance and performance measures, positioning the vertical and horizontal axes of the grid, median values as a measure of central tendency, and analyzing the importance-performance grid. Furthermore, this analysis is formulated as follows:

$$Tki = \frac{\overline{Xi}}{\overline{Yi}} * 100\%$$

Where:
Tki = the suitability level of respondent
Xi = average score of company performance appraisal.
Yi = Average score of respondents' expectations.

After measuring the level of suitability, the next step is to make a performance-importance position map, divided into four squares and bounded by two perpendicular intersecting lines at the following points:

$$\overline{\overline{X}} = \frac{\sum_{i=1}^{N} \overline{Xi}}{k}$$

$$\overline{\overline{Y}} = \frac{\sum_{i=1}^{N} \overline{Yi}}{k}$$

Where:
Tki= the suitability level of the respondent.
X= the average of the average score for the performance level of all attributes.
Y= the average of the average score for the level of expectation of all attributes.
k= the number of attributes that affect satisfaction.

Furthermore, the horizontal axis (X) is filled with the perception level score, while the expectation level score serves the vertical axis (Y). In simplification of the formula, it is for each attribute is used in equations 4 and 5 as follows:

$$\overline{X} = \frac{\sum Xi}{n}$$

$$\overline{Y} = \frac{\sum Yi}{n}$$

Where :
X = average score of perception/performance.
Y = average score of expectations/importance.
N = the number of respondents.

The importance-performance analysis is divided into four quadrants for all variables that affect quality. Finally, the results of this analysis form the basis for compiling the output value innovation, as illustrated through the strategy canvas developed by Kim and Mauborgne (1997), who explain that a strategy canvas is a primary diagnostic framework that graphically captures, in one simple picture, the

current strategic landscape and the prospects for an organization.

2. Qualitative analysis for process value Innovation and business model innovation

This study analyzed how to add value and reduce environmental impact as part of process value innovation and performed deductive content analysis for model business innovation. These two analyses continue from the prior sustainability and collaborative relationships assessments; both are valuable tools for creating value innovations.

Fearne *et al*. (2009) introduced an analysis for adding value and reducing environmental impacts, categorizing activities of each actor along the value chain that impact the added value and environment; actors were grouped based on quantitative sustainability assessment results. Groups are shown in a matrix separate from the IPA matrix. The impact of an activity is better if the added value is high and the emissions are low. Creating process value innovation refers to the activity position in the matrix.

Ostelwalder and Pigneur (2010) introduced the business model canvas to elaborate between value proposition, process value innovation, and other aspects, including essential partnerships, relationships, consumer segments, resources, channels, costs, and revenues. The business model canvas connects the nine elements in one canvas. The first canvas reflects the existing business model, while the second offers the new one.

Data analysis follows three streams simultaneously; data condensation, data display, and conclusion withdrawal or verification. Condensing the data consists of various procedures, including selecting, simplifying, abstracting, and transforming the data in the whole body of written field notes, interviews, transcripts, and documents. Data presentation makes it easy to see the overall picture or certain parts, while the conclusion stage describes the main findings through a strategy canvas. Finally, researchers test the validity of the data using triangulation techniques of sources and methods

4. Results and Discussion

Value innovation is a new way of thinking and executing strategies that lead to creating blue oceans and abandoning competition. Value innovation is the cornerstone of the blue ocean strategy. Kim and Mauborgne (2004) state that the blue ocean strategy rarely relates to technological innovation. For example, Ford's revolutionary automobile assembly plant can be traced to the beginning of its application to the meat-packing industry in the United States.

4.1. Halal beef (output) value innovation

Value innovation places equal emphasis on value and innovation. Value without

innovation tends to focus on creating value on a large scale. Innovation without value tends to rely on technology and often targets something buyers are not ready to accept or consume. Creating value innovation is all about reducing costs while increasing value for consumers, so innovation as an outcome emphasizes output (Kahn, 2018). For the halal beef industry, the output is the product, that is, fresh halal beef. Consumer value is explored in the Indonesian halal beef industry based on consumer preference with intrinsic and extrinsic attributes. Furthermore, the attribute of consumer preference is compared with its performance as the basis of value innovation for the new value proposition of halal beef.

Figure 2 shows the importance-performance matrix that reveals the position of the halal beef attribute as below:

1. Quadrant A is the quadrant with high or first priority. Variables in quadrant A have a top priority for improvement because the quadrant variables have high importance but low performance. For beef, the attribute in this quadrant is texture.
2. Quadrant B has above-average importance and performance level. Overall, the attribute in this quadrant must be maintened. However, some attributes must be improved based on the comparison between attributes. This quadrant's attributes are newness, halal status, appearance, aroma, texture, hygiene, residues free, Muslim shop owner, and price. The performance of the first six attributes must be improved beyond the performance of the last two attributes.
3. Quadrant C is a quadrant with low priority. C quadrant's intended variables are considered low priority and less important for beef consumers in Indonesia. The attributes in this quadrant are taste, availability, nutritional value, product origin, packaging, shopping location, fat content, traceability, size, display, and ease of preparation.
4. Quadrant D is a quadrant with an excessive scale because consumers consider the attributes in quadrant D to be unimportant but are nonetheless very well-provided beef suppliers. The attribute in this quadrant is grade.

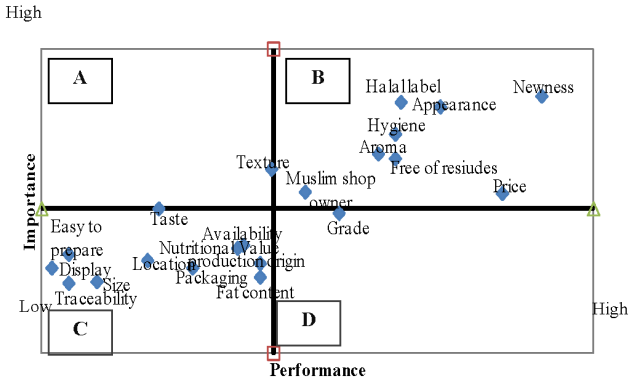


Figure 2. The importance-performance matrix of halal beef attribute

The halal label provides specific information about the halal status of the beef. Consumers do not want to know detailed information about the activities along the halal supply chain. Halal labeling has assessed all information along the supply chain, including all kinds of information from different stages of farming, slaughtering, processing, and retailing. In a traceable halal system, it is essential for all supply chain actors to obtain a halal certificate from halal certification institutions in Indonesia. In addition to halalness, the nutritional value of meat is a major factor when consumers consider which cut of beef to buy, but when consumers have determined the desired cut, they prefer it based on beef's newness.

Based on these findings and field observations, the canvas strategy is developed in Figure 3. This figure also shows three aspects: the importance level of halal beef attributes (importance value proposition), the performance level of the attributes (existing value proposition), and the innovation level of the attributes (new value proposition). The value proposition shift utilizes a four-action framework.

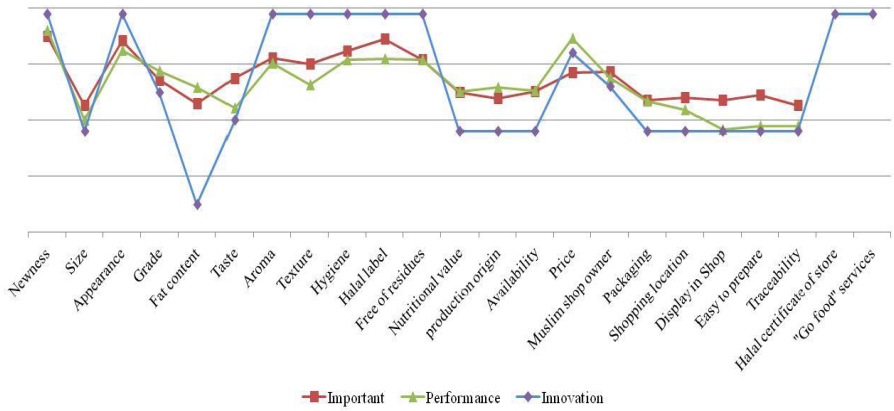


Figure 3. Strategy canvas for halal beef value innovation
Source: Mahbubi (2019, 2020)

The first-action framework is elimination. Indonesian consumers do not prefer beef with fat on the meat's surface. They believe that fat in beef contains high amounts of cholesterol, which is not good for health, so consumers usually choose lean beef. Lean beef does not mean that it has no fat content; rather, it has very little fat content compared to other cuts of meat. Therefore, halal beef suppliers should eliminate the fat content of halal beef.

The second-action framework is the reduction aspect. The majority of middle-class consumers in Indonesia are not concerned with halal beef's extrinsic attributes. Even Indonesian consumers do not categorize beef prices as an essential attribute, and Dewi *et al*. (2017) stated that beef tends to be price inelastic. Halal beef suppliers can reduce the focus on size, grade, taste, nutritional value, product origin, beef availability, packaging, shopping location, display in the shop, ease of

preparation, traceability, price, and a Muslim shop owner.

The third-action framework is increase or raise. Indonesian Muslim consumers are more concerned with the intrinsic values than the extrinsic values of halal beef. They assess intrinsic attributes as attributes they can directly feel, the most important of which are newness, appearance, aroma, texture, hygiene, residu free, and halal labelling. Therefore, all halal beef value chain actors should increase their activities to guarantee the seven most important attributes.

The fourth-action framework is create. Various consumers in Indonesia said it would be better if halal meat shops also had halal certification. Their reason is that this guarantees that the beef in the shop is not contaminated by haram meat, such as pork. In addition, actors along the halal beef value chain must exploit the recent massive-scale development of online platforms to provide new value propositions for customers.

4.2. Process Value Innovation

Value innovation is a strategy that embraces the entire system of company activities, even inter-companies activities. Value innovation requires companies to steer the whole system towards achieving leaps in value for both buyers and companies. Process innovation concentrates on value-adding activities (Al-Sa'di *et al*., 2017) and requires openness (Von Krogh *et al*., 2018).

For halal products, openness is not only about the activities themselves but also about halal critical points of information. Figure 4 presents the value-emissions trade-off matrix that classifies each activity and halal critical point potentially to create consumer value and reduce environmental impact, as below.

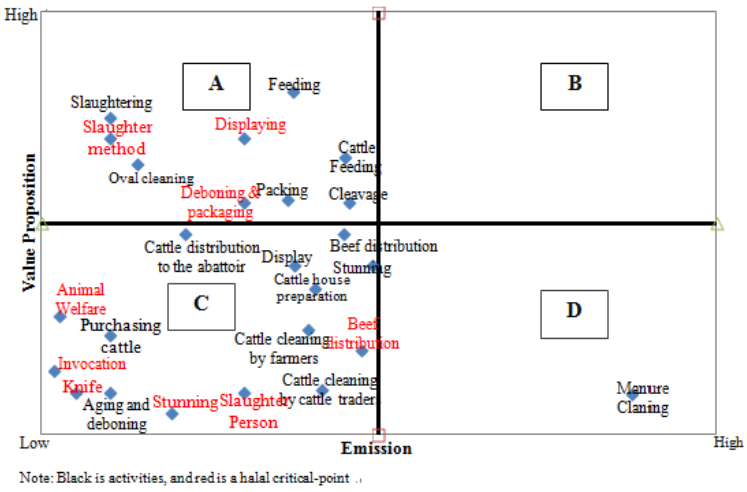


Figure 4. Value-emissions trade-off matrix
Source: Mahbubi (2019, 2020)

1. Quadrant A reveals the activities and halal critical points have high value-added impacts but low emissions. The activities and halal critical points in this quadrant should be a major priority for improvement. Activities at this priority are cattle feeding in the abattoir, slaughtering, butchering, and packing for beef producers and feeding in the cattle sheds for cattle farmers.
2. Quadrant B illustrates the activities and halal critical points which have a high value-added and emission. However, there are none for this assessment.
3. Quadrant C explains the activities and halal critical points which have a low value-added and emission impact. Activities and halal critical points in this quadrant are not priorities for improvement. The activities in this quadrant were cattle shed preparation, purchasing cattle, cattle cleaning by farmers and wholesalers, cattle distribution to the abattoir, stunning, aging, and deboning, beef distribution, and beef display. In addition, the halal critical points in this quadrant were animal welfare, religious invocation, the stunning, knife used, butcher, and beef distribution.
4. Quadrant D clarifies the activities and halal critical points which have a low impact on value-added but a high impact on emissions. The activities in this category are a source of emissions, and the most significant emission in the halal beef value chain is cattle dung.

Based on these findings, the canvas strategy is developed in Figure 5. This figure shows three aspects: value proposition, emissions, and innovation. Activity priority also utilizes a four-action framework. These activities are carried out by one stakeholder alone or various stakeholders in the beef value chain.

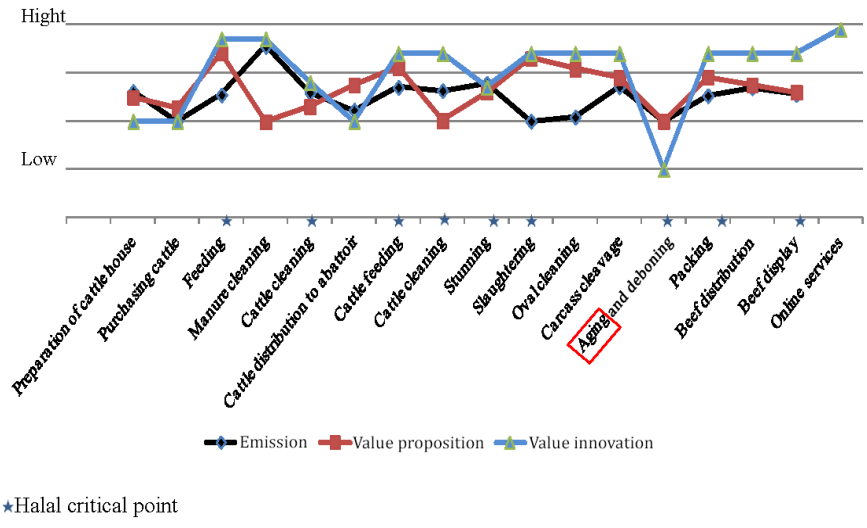


Figure 5. Canvas for halal beef process value innovation

The first-action framework is elimination. Indonesian consumers prefer fresh beef. For consumers of fresh halal beef, the aging and deboning process indicates an attempt to make frozen and chilled beef. Indonesian consumers assume both types of beef are no longer fresh, and therefore, they usually purchase beef in wet markets where sellers always provide fresh beef. Consequently, beef producers should eliminate aging and deboning activities.

The second action framework is reduction and aspects which are unchanged. All halal beef actors do not change their activities pattern. For example, feedlots are the preparation of cattle houses and purchasing cattle, and these activities have low value-added and emission impacts. Existing feedlot activities can be maintained to protect cattle from cattle disease.

The third-action framework is increases or raises. Cattle farmers must pay attention to the type of feed, the time of feed, and other feed elements. They also must be able to reduce waste from cattle dung through manure management. Beef producers also must pay attention to the cattle feed before slaughtering. The abattoir should also implement standard operating procedures for stunning, slaughtering, butchering, packing, and distribution of beef.

The fourth-action framework is creation. Beef retailers should create online platforms or services, which can be developed by collaborating with other retailers to reach different customer groups. Alternatively, retailers could use existing mobile phone apps to distribute beef

4.3. Business Model Value Innovation

Since buyer value comes from the utility of the product or service (benefits) and the price at which it is offered, and because the value to the business results from the price and cost structure, value innovation is achieved only when the business's entire system of activities, prices, and costs is properly integrated. Supplier collaboration is the most important factor in innovation capabilities (Najafi-Tavani *et al*., 2018) and collaborative innovation approaches seek to integrate them (Swink, 2006). Collaborative innovation refers to the output of a new value proposition and process improvement (Bonney *et al*., 2009). Amit and Zott (2015) state that business model innovation completes the product and process innovation.

Figures 6 and 7 show Indonesia's current and future halal beef business model canvases. These figures present the nine elements of the halal beef business model canvas, adapted from the business model canvas of Osterwalder and Pigneur (2010). The nine elements are customer segment, value propositions, channels, customer relationships, revenue stream, key resources, key activities, key partnerships, and cost structure.

The halal beef consumer segment in Indonesia comprises sanctity (the quality of being holy), clarity (emphasis on beef appearance), quality (preferring good

beef texture and aroma), and safety (hygiene and residue-free being prioritized). The current and future halal business model canvases are the same, with a trend that the importance of safety will increase due to the Coronavirus-19 (Covid-19) pandemic and changes in consumer behavior to prioritize hygiene (safety).

The value proposition is the value that the company offers to its customers. It is a combination of products and services that create value and satisfaction for customers. In this study, the value proposition is used by looking at the added intrinsic and extrinsic values the company provides to customers. The halal beef value proposition consists of 21 attributes, but based on product value innovation, it becomes 23 attributes: eliminating one attribute (fat on beef surface), reducing the focus on 13 attributes (size, grade, taste, nutritional value, production origin, beef availability, packaging, shopping location, display in the shop, easy to prepare, traceability, price, and Muslim shop owner), increases focus on the seven most important attributes (newness, appearance, aroma, texture, hygiene, residue free, and halal labeling), and creates two attributes (halal certification of the store and digital services).

Key activities are a series of activities by various actors in the value chain to create a product that can provide value to its customers. The building blocks of key activities represent the most important things a company must do for its business model to work. Figure 7 presents that, generally, beef producers should eliminate aging and deboning activities. Otherwise, each actor keeps doing their activities according to what they currently do, such as preparing cattle sheds and distributing cattle to the abattoir. However, each actor should take seriously their activities that impact values and emissions, such as feeding by farmers and slaughtering by beef producers, as well as creating online services for their customers. In addition, feeding management requires integrated feed (cattle crop integration).

Key partnerships are parties involved along the halal beef value chain. The key partnership block describes the network of suppliers and partners that make the business model work. The halal beef value chain's key players are cattle farmers (feedlots), beef producers (cattle traders, cattle wholesalers, abattoirs, beef wholesalers), and beef retailers.

Customer relationship is the relationship style of actors in the value chain. The collaborative relationships between partners in Indonesia's halal beef value chain are categorized as collaborative transactions. Based on aspects of trust and commitment, there are no formal contracts, partners rarely monitor each other, there is minimal attention paid to sustainability aspects, and partners are less proactive, which reflects a lack of mutual evaluation. The alignment aspect also indicates task alignment yet a lack of strategic alignment, which is relevant as dependencies can reduce problems with halal beef availability. These aspects should be improved, such as partners always monitoring each other and having a long-term orientation with good resource management.

Key resource blocks describe the most important assets or resources required to business process models to function. Key resources are classified as cattle (including local and imported cattle), human resources (high number of cattle farmers and many job opportunities), and digital resources. Each actor has a mobile phone with various apps, which can strengthen their relationships as well as strengthen online services.

Digital services can keep beef fresh because distribution channels are becoming shorter. The distribution channel will shift from type 1 to type 3 (figure 7). Distribution channel type 1 involves feedlots, cattle wholesalers, dealers, beef wholesalers, retailers, and households, while distribution channel type 3 covers feedlots, cattle wholesalers, dealers, beef wholesalers, and consumers.

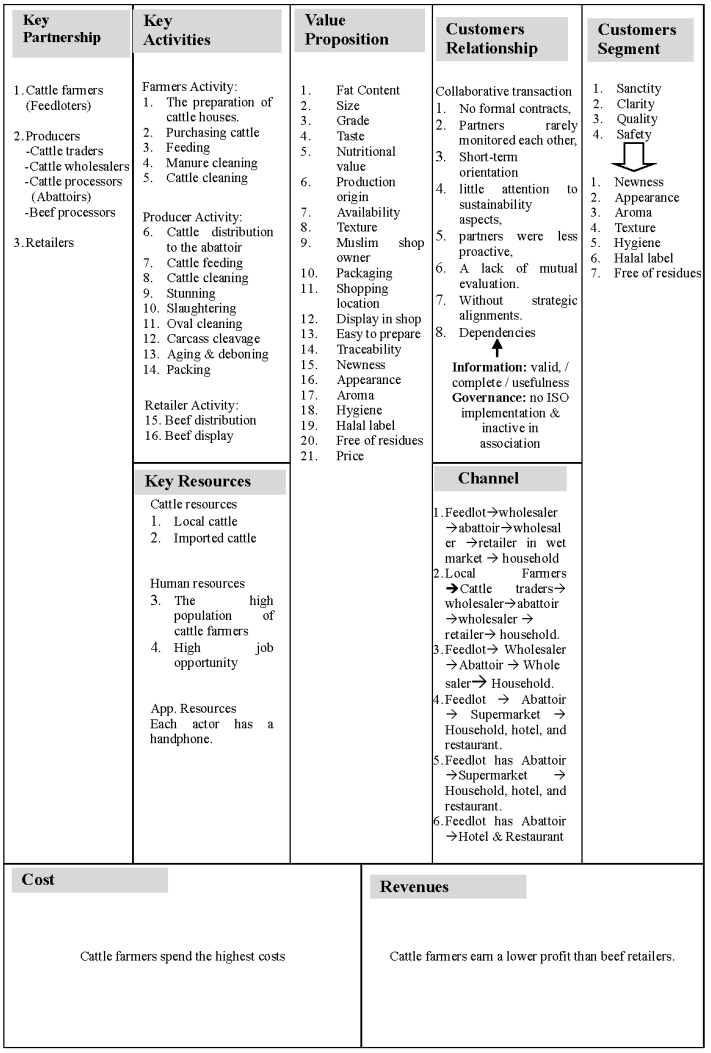
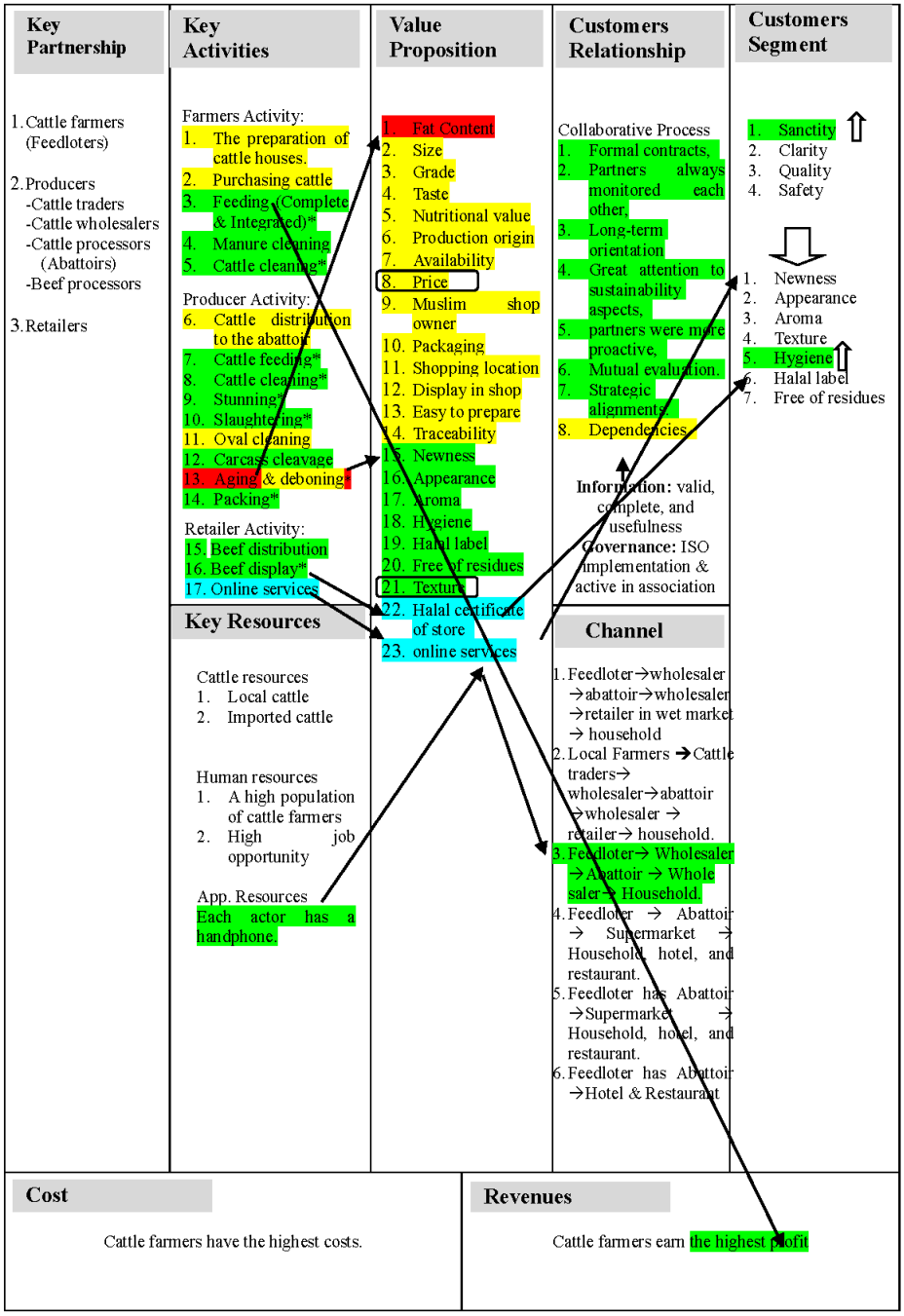


Figure 6. The current of halal beef business model canvas in Indonesia



Note: Grey = the nine element, blue = create, green = raise, yellow = reduce, and red = eliminate *halal critical point

Figure 7. The future of halal beef business model canvas in Indonesia

Furthermore, the cost and revenue block describe cattle farmers having the highest costs, but cattle farmers earn a lower profit than beef retailers. According to the strategy canvas of process value innovation, farmers should improve feeding management. It can be done by developing an effective and efficient formulation or by reducing feed costs without reducing the cattle' quality.

5. Conclusion and Implication

Product value innovation drives halal beef producers, and suppliers should eliminate the fat content of halal beef. They should reduce the focus on size, grade, taste, nutritional value, production origin, beef availability, packaging, shopping location, display in the shop, ease of preparation, traceability, price, and Muslim shop owners. They should increase the attributes of newness, appearance, halal labeling, texture, aroma, hygiene, and free of residues. They create online services and obtain halal certification of stores.

Process value innovation presents that beef producers should eliminate aging and deboning activities. Each actor keeps doing their activities according to what they currently do, but each actor should also consider their activities' impact on values and emissions. Cattle farmers should improve feeding management to earn higher profits, while beef retailers should create online customer services.

Business model innovation completes value innovation by integrating product and process value innovation with other elements. Business model value innovation should change relationship patterns from collaborative transactions to collaborative processes, such as partners always monitoring each other and having long-term orientation with good resource management. In addition, digital resources can be utilized for online service development as new distribution channels.

Finally, the business model value innovation will shift from the red ocean to the blue ocean. Business patterns change from competition to collaboration. The innovation value will strengthen the Indonesian halal beef industry.

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