J I T A A
Journal of the Indonesian Tropical Animal Agriculture
Accredited by Ditjen Penguatan Risbang No. 60/E/KPT/2016

J. Indonesian Trop. Anim. Agric.
pISSN 2087-8273 eISSN 2460-6278
http://ejournal.undip.ac.id/index.php/jitaa
46(3):258-269, September 2021
DOI: 10.14710/jitaa.46.3.258-269

Business strategy of salted egg agro-industry to achieve sustainable competitive advantage

W. Sumekar*, A. N. Al-Baari and A. Setiadi
Faculty of Animal and Agricultural Sciences Diponegoro University
Jl. Prof. Sudharto, SH Tembalang, Semarang, Indonesia
**Corresponding E-mail: wulan_sumekar@yahoo.co.id*

Received May 30, 2020; Accepted June 12, 2021

ABSTRAK

Strategi bisnis merupakan upaya mencapai keuntungan kompetitif berkelajutan suatu agro-industri. Tujuan penelitian terhadap sentra agro-industri telur asin menjadi model pengembagan bisnis. Telur itik asin memiliki keunggulan telah dikenal oleh masyarakat di negara-negara Asia Tenggara dan Asia Timur. Penelitian observasional dilakukan pada 105 agroindustri telur asin di Kabupaten Brebes. Data 22 variabel kuantitatif strategi pengembangan dikumpulkan melalui wawancara menggunakan kuestioner. Metode kerangka kerja formulasi strategi diterapkan untuk menentukan strategi alternatif spesifik untuk mencapai keunggulan kompetitif yang berkelanjutan. Hasil penelitian menunjukkan bahwa dalam proses agroindustri telur asin belum didukung oleh ketersediaan telur itik dan industri hulu (50,58%), namun rata-rata konsumen menyukai produknya karena keunggulan rasa (52,38%), tekstur (58,10%) dan harga (71,43%). Agroindustri telur asin berada pada posisi agresif dengan tingkat persaingan yang kuat dan pertumbuhan yang cepat. Konsep strategi terbaik untuk pengembangan kebijakan bisnis adalah penetrasi pasar. Strategi penetrasi pasar yang dipilih adalah meningkatkan promosi dan volume penjualan. Strategi penetrasi pasar disarankan menjadi model pemberdayaan agroindustri telur asin dan komoditas agroindustri umumnya sehingga kegiatan peternakan itik dan industri hulu dapat terungkit..

Kata kunci: agroindustri, berkelanjutan, keunggulan kompetitif, strategi bisnis, telur asin

ABSTRACT

Business strategy is an effort to achieve a sustainable competitive advantage in an agro-industry. The research objective on salted egg agro-industrial center is to identify a model for business development. The advantages of salted duck eggs have been recognized by people in south east asian countries and east asian countries. This observational research was conducted on 105 salted egg agro-industries in Brebes Regency. Data on 22 variables of quantitative strategic planning were collected through interviews using a questionnaire. Strategy formulation framework method was applied to determine specific alternative strategies to reach sustainable competitive advantage The results showed that the salted egg agro-industry were not supported by the availability of duck eggs and upstream industry (50.58%) although most consumers were fond of salted egg due to its taste (52.38%), texture (58.10%), and price (71,43%). The salted egg agro-industry was in the aggressive position. The best strategy concept for

business policy development was market penetration The market penetration strategy was chosen, namely increasing promotion and sales volume. Market penetration strategy is suggested to be the model for empowering salted egg agro-industry and agro-industrial commodities in general so that the activity of duck farming and upstream industry can be leveraged

Keywords: agro-industry, business strategy, competitive advantage, salted eggs, sustainable

INTRODUCTION

It is widely known that the process of transformation in agricultural sector involves both upstream and downstream of agro-industrial sectors (Reardon *et al.,* 2019). Development of the upstream agro-industries might drive an increase in regional income contribution through exports, while the downstream agro-industries play an important role in distributing income equally to both agricultural and non-agricultural households (Berchoux *et al.*, 2019; Al-Baarri *et al.,* 2019).

One of the downstream agro-industries' products is salted egg, a product which has long been known by people in South East Asian Countries (Indonesia, Malaysia, the Philippines, and Singapore) and East Asian Countries (China and South Korea) (Lai *et al.*, 1999; Sumekar *et al.*, 2018). Producing salted egg is unique, relatively simple and inexpensive, but it requires relatively a perfect salting time to get a high organoleptic level (Lei *et al*., 2013; Sumekar *et al*., 2013). As traditionally manufactured, salted egg remained several issues.

In the development of agro-industries, complexities, competitions, and uncertainties pressurize the agro-industries contributes to easily fail of its sustainability. On the other hand, agro-industry is an important sector to prevent issues in economic growth and the reduction in poverty (Houedjofonon *et al.*, 2020). An example of a prominent agro-industry of salted eggs is in Brebes Regency, Central Java Province, Indonesia. Since salted egg was a significantly dominant product in this region, the study should be conducted in achieving the goals for buffering poverty. As prominent national salted egg producer, Brebes regency has been recorded to produce 12 million salted egg monthly with the revenue as much as USD 1 million (Humam *et al.* 2018). This may explain that the study in this regency might help national's issue.

Based on our knowledge, there has not been any study about salted eggs agro-industries except the data provided by government (Statistics Indonesia of Brebes Regency, 2018) including the model of development. Furthermore, the model development of small and medium enterprises could be applied with ease involving potential actions in order to achieve the competitive advantage as the basis to achieve sustainable business goals (Pearce and Robinson, 2005). In addition, the model has to be oriented to the characteristic of the industries both internally and externally. Consequently, the industries have to achieve sustainable competitive advantages by continuing adapting to external environments, while utilizing internal resources. In this case, the success of the industries to win a competition is determined by the effectiveness of the industries in formulating, implementing, and evaluating strategies chosen by selecting favorable characteristic (Rangkuti, 2001; David, 2009). Therefore, the objective of the research was to identify a proper model for salted egg business development in Brebes regency. The benefit of this study are expected to be useful as a model for the impowering of salted egg agro-industry and agro-industrial commodities in Brebes and it might be applied in national scope.

MATERIALS AND METHODS

This study applied David's (2009) Strategy Formulation Framework (SFF), it was conducted in Brebes Regency, the center of salted eggs agro-industries in Central Java Province (Statistics Indonesia of Central Java Province, 2018). Descriptive analyses were applied to analyze data collected from 105 agro-industries of salted egg selected based on ownership of the

place to sell their eggs. The data were collected by interview to respondents and observation, and in depth interview with representative of the owners and stakeholders.

Data collected were statistically analyzed following the procedure below:

Descriptive statistical analysis to determine frequency distribution of production process characteristic and weighted frequency distribution of consumer preferences for salted eggs.

Analysis of formulation framework strategy of David (2009) consisting of:

Input stage, in which matrix of External Factor Evaluation (EFE) and Internal Factor Evaluation (IFE) (Ommani, 2011; Suhartini, 2013; Osita *et al*, 2014; Cyrilla *et al.*, 2016) were used.

Matching stage, in which Internal-External matrix, strategic sositioning, and action evaluation (SPACE) Matrix (Gurbuz, 2013), and Grand Strategy Matrix to determine formulation process of alternative strategy (Ommani, 2011; Cyrilla *et al.*, 2016) were used

Decision stage and strategy selection (Decision Stage), in which QSPM matrix (Quantitative Strategic Planning Matrix) (Ommani, 2011) was used.

Assessment of the weight of each internal and external factors used analytical hierarchy process (AHP) method, in which all identified factors in the EFE and IFE matrices (Saaty, 2008) were assessed. AHP is a theory to measure and identify ratio scale of pairwise comparison. The weight of the matrix pairwise comparison used was scale 1 – 9. The matrix pairwise comparison was as follows:

$$A = \begin{bmatrix} a_{11} & \cdots & a_{1n} \\ \vdots & & \vdots \\ a_{x1} & \cdots & a_{xn} \end{bmatrix} = \begin{bmatrix} w_1/w_i & \cdots & w_1/w_n \\ \vdots & & \vdots \\ w_x/w_i & \cdots & w_x/w_n \end{bmatrix}$$

where A = comparison matrix, w = eigen vector, and n = dimension matrix

Consistency index was measured by the following formula:

$$\mathrm{CI} = \frac{\lambda \max - n}{n - 1}$$

The assessment base AHP is depended upon the value of the consistency ratio using the following formula: CR = CI / RI

Where RI is the Ratio Index generated from the number of n, as follows:

N	1	2	3	4	5	6
RI	0	0	0.56	0.9	1.12	1.24

N	7	8	9	10	11	12
RI	1.32	1.41	1.45	1.49	1.51	1.58

CR or consistency ratio =≤ 0.1 was considered as consistent.

RESULTS AND DISCUSSION

Characteristics of Salted Egg Agro-industry

The quality of egg depends on many factors, i.e. farm model and supplement (Milkulski *et al.*, 2020), and also egg composition (Philippe *et al.* 2020). Therefore, the characteristic of salted egg was explained in this research. The product of salted eggs agro-industries on the market was found to have ununiformed quality between one agro-industry and another. The characteristics of salted egg production in Brebes Regency showed that respondents applied dressing method with husk ash as the main ingredient in a mixture of salt and water. A total of 85.72% of respondents used salting technology of 2 - ≥ 2 weeks. All salted egg agro-industries involve female workers, among which 52.38% of respondents have variable production frequencies. In terms of salted egg processing, 50,58% agro-industry used duck eggs from outside region and no supported the upstream agro-industry indicating the high demand of salted egg consumers.

Most respondents have produced high quality salted eggs with a proper process. According to Kaewmanee *et al.* (2009) and Surainiwati *et al.* (2013), on the 14th day of salting, the peak of quality could be achieved in duck eggs including their chemical composition, physical property, and microstructure resulting the best taste of salted eggs. The best taste might also

represent the best ingredients inside since the peak of ingredient appearance was relied on the proper time of process and method of treatments (Villa *et al.*, 2014).

The main material of salting is husk ash that is collected from many brick industries using rice husk as the material for burning clay bricks (Statistics Indonesia of Brebes Regency, 2018). In this case, Novia *et al.* (2014) argued that using husk ash is less quality than wood ash for salting because wood ash contains minerals such as P, Ca, Mg, and K to maintain pH of the albumin, yet wood ash does not affect organoleptic value.

The following are the characteristic of salted egg agro-industries: they had no fixed production frequency, had been dominated by female labors, and had no efforts to increase value added. The management of salted egg production was indicated as traditional. Salted eggs agro-industries in Brebes regency are categorized as home industries (Statistics Indonesia of Brebes Regency, 2018) in terms of using simple and traditional technology, and having small capital to start a business. Therefore, according to Patil and Babus (2018), applicable technologies shall be delivered to female farmer in order to improve both capacity building and productivity. However, this finding was not in line with the Fadhil *et al.* (2017) finding that agro-industry development had to be based on the development of sustainable agricultural-based economic activ-

Table 1. Internal Matrix Evaluation (IFE) and External Matrix Evaluation (EFE) of Salted Egg Agro-industry

Internal Factor				External Factor			
Assessment	Weight (0-1)	Rating (1- 4)	Score	Assessment	Weight (0-1)	Rating (1- 4)	Score
	Strength				Opportunity		
Cultural Heritage	0.10	3.6	0.36	Integration of Agribusiness	0.09	3.5	0.31
Unique Taste	0.11	3.7	0.41	Market Expansion	0.10	36	036
Driver of Family Economy	0.14	3.8	0.53	Microeconomic Development Program	0.15	3.8	0.57
Business Motivation	0.12	3.7	0.44	Availability of Labor	0.12	3.7	0.44
Product Options	0.09	3.7	0.33	Consumer Preferences	0.09	3.7	0.33
Weakness					Thread		
Small Business Scale	0.07	3.2	0.22	Price Competition	0.08	3.0	0.24
Less Promotion	0.08	2.7	0.21	New Competitors	0.08	3.2	0.26
Low Access to Capital	0.07	2.8	0.20	Changes Lane of Inter City Bus	0.08	3.0	0.24
Understanding of The Market	0.07	3.1	0.22	Business Assistance	0.08	28	0.22
Quality of Duck Eggs	0.06	2.9	0.17	Salty Taste Is Not Healthy	0.07	2.6	0.18
Duck Eggs Fluctuation	0.08	3.2	0.26	Business Environment	0.06	2.7	0.16
Total	1.00		3.35	Total	1.00		3.31

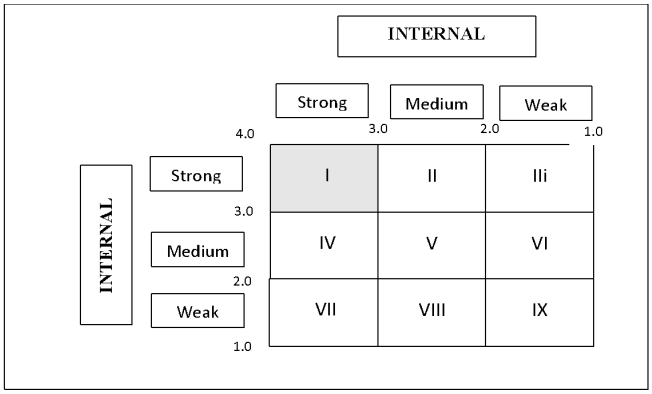

Figure 1. Evaluation of Internal-External Matrix of Salted Eggs Agro-Industries

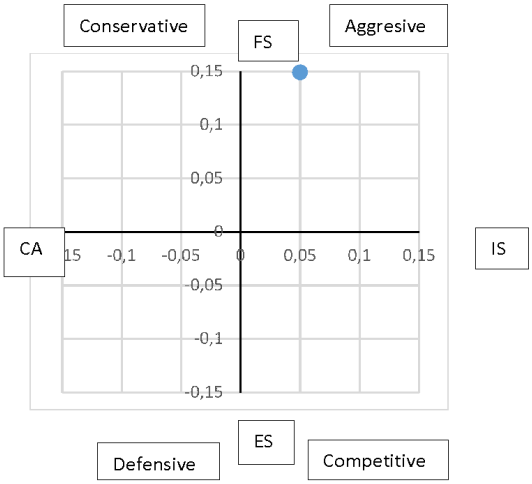

Figure 2. Strategic Position of Salted Egg Agro-industry Based on SPACE Matrix

ities.

Based on the results of interviews with salted egg agro-industry entrepreneurs, the consumer's preference for salted eggs is determined by the taste, texture, aroma and color of the yolk, and price. Most consumers (71.43%) preferred to the price of the salted eggs, while 58.10% of consumers preferred the texture and 52.38% like the taste of the salted eggs representing the consumer preference as beyond average. The preference is relied on the saltiness that was also described by Kaewmanee *et al.* (2011) that duck salted eggs have the highest organoleptic levels at the highest eggs salinity levels for texture and taste.

Strategy Development of Salted Eggs Agro-industries

Strategies to develop salted eggs agro-industries are involving stages of input, matching and decision making, and selection strategy. Stages to develop strategy development of salted eggs agro-industries followed the strategy formulation framework method of David (2009) that consisted of input stage, matching stage, and decision making stage to select a strategy:

Input Stage**.** In this stage, Internal Matrix Evaluation (IFE) and External Matrix Evaluation (EFE) were used to analyze environmental factors of salted agro-industries (Table 1).

Table 2. Matrix Strategic Positioning and Action Evaluation Matrix Strategy

Internal Strategic Positions				External Strategic Positions			
Competitive Advantage (CA)				Industry Strength (IS)			
Key Factor	weight	score	value	Key Factor	weight	score	value
Product quality	0.05	-3.40	0.17	Potential Earnings	0.05	3.90	0.20
Brand and image	0.04	-3.40	0.14	Growth Potential	0.04	3.70	0.15
Efficiency	0.05	-3.20	0.16	Local Wisdom	0.05	3.80	0.19
Sustainability	0.05	-3.20	0.16	Capacity Utilization	0.05	3.40	0.17
Unique preference	0.05	-3.60	0.18	Financial Access	0.04	3.80	0.15
x axis score : 0,05							
Financial Strength (FS)				Environment Stability (ES)			
Key Factor	weight	score	value	Key Factor	weight	score	Value
Capital Turnover	0.05	3.80	0.19	Competitors	0.03	-2.80	0.08
Location of agro-industry	0.05	3.50	0.18	Environmental support	0.05	-3.60	0.18
Economic Drivers	0.05	3.90	0.20	Government financial support	0.03	-2.80	0.08
Forward and backward integration	0.04	3.70	0.15	Government certification support	0.04	-3.20	0.13
Input Supplier Connection	0.04	3.80	0.15	Infrastructure support	0.05	-3.80	0.19
y axis score : 0.15							

Table 1 shows that salted egg as the driver of family economy positioned in the strength factor has weight, rating, and score 0.14, 3.8, and 0.53, respectively. However, the duck eggs fluctuation as the weakness factor has weight, rating, and score 0.08, 3.2, and 0.26, respectively.

Salted egg agro-industry was in the internal position so that it was strong enough to minimize weaknesses. In addition, this position was strengthened by contribution of gross regional domestic product (GRDP) from manufacturing industry to GRDP of Agriculture, Forestry, and Fisheries sectors by 47.40%, while participation level of female labor force in Brebes Regency is 51.7% (BPS of Brebes Regency, 2018).

Furthermore, Table 1 also shows that in the External Factor Evaluation (EFE) matrix, the highest result of the opportunity factors is obtained by microeconomic development program that has a weight of 0.15 and rating of 3.8, with a total score of 0.57. On the other hand, the highest threat factor is new competitor, which has a weight of 0.08 and a rating of 3.2 with a total score of 0.26.

The result of the EFE analysis indicated that agro-industry was in a position of opportuni-

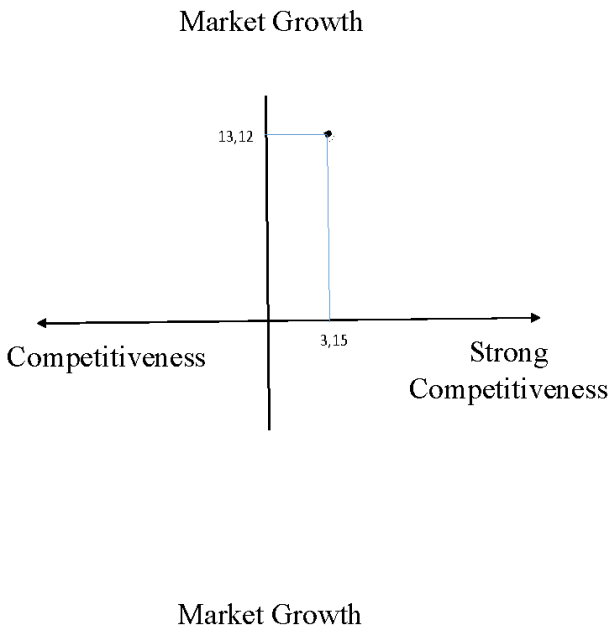

Figure 3. Strategic Position of Salted Eggs agro-industries in Brebes Regency based on Grand Strategy Matrix

ty. Therefore, salted egg agro-industry was able to deal with the threats. This finding was in line with Kotler and Armstrong's (2012) finding that efforts to develop agro-industries in order to increase added value of eggs by forward integration are profitable. Therefore, salted egg agro-industry was expected to be able to utilize the strength and the opportunity factors to develop its industry.

Matching Stage**.** Matching stage was conducted using internal-external (IE) matrix, SPACE (strategic positioning and action evalua-

Table 3. Profile of Salted Egg Agro-industrial Competitive in Brebes Regency

Strategic Factor	Weight	Rating	Score
Competitive Advantage			
Cost	0.17	3.20	0.54
Distribution	0.12	2.40	0.29
Product Quality	0.17	3.90	0.66
Product Variations	0.25	4.00	1.00
Human Advantage			
Market Knowledge	0.12	1.80	0.22
Innovation	0.17	2.60	0.44
Total	1.00		3.15

Table 4. Quantitative Strategic Planning Matrix (QSPM)

Key Factors	Weight	Market Penetration		Market Development		Product Development	
		AS	TA	AS	TA	AS	TA
Integration of Duck Agribusiness	0.09	3.4	0.31	4.00	0.36	3.60	0.32
Market Expansion	0.10	3.6	0.36	2.40	0.24	3.20	0.32
Microeconomic Development Program	0.15	3.8	0.57	3.30	0.50	2.80	0.42
Labor availability	0.12	3.4	0.41	3.50	0.42	3.80	0.46
Consumer Preferences	0.09	3.8	0.34	3.40	0.31	3.20	0.29
Price Competition	0.08	3.2	0.26	3.60	0.29	3.00	0.24
New Competitors	0.08	3.2	0.26	3.20	0.26	3.00	0.24
Changes Lane of Inter City Bus	0.08	3.4	0.27	2.80	0.22	2.90	0.30
Business assistance	0.08	3.2	0.26	3.20	0.26	2.40	0.19
Saltiness is not healthy	0.07	2.5	0.18	2.80	0.20	3.00	0.21
Business Environment	0.06	3.0	0.18	3.20	0.19	3.00	0.18
Products of Cultural Heritage	0.10	3.5	0.35	3.30	0.33	3.40	0.34
Unique Taste	0.11	3.6	0.40	3.40	0.37	2.80	0.31
Driver of Family Economy	0,14	3.2	0.45	4.00	0.56	2.40	0.34
Business Motivation	0.12	3.2	0.38	3.00	0.36	3.40	0.41
Availability of product selection	0.09	4.0	0.36	4.00	0.36	3.30	0.30
Small Business Scale	0.07	3.4	0.24	3.30	0.23	3.00	0.21
Lack of Promotions	0.08	3.2	0.26	3.00	0.24	3.20	0.26
Low Access to Capital	0.07	3.0	0.21	3.20	0.22	3.00	0.21
Understanding of the Market	0.07	2.8	0.20	2.50	0.18	3.00	0.21
Quality variation of Duck Eggs	0.06	3.0	0.18	2.80	0.17	2.80	0.17
Fluctuated Availability of Duck Eggs	0,08	2.9	0.23	3.00	0.24	2.60	0.21
	1,00		6.56		6.51		6.40

tion) matrix, and grand strategy matrix.

Internal-External (IE) Matrix Analysis. Referring to calculations in Table 1, the total score of the internal factor of salted eggs agro-industries is 3.35 and the external factor is 3.31. These figures positioned the salted eggs agro-industries as depicted in Figure 1. Internal matrix analysis (Figure 1) shows that the position of the salted eggs agro-industries is in cell I. This position indicated that the strategy applied by salted eggs agro-industries, which were growth strategy, had an opportunity to continue to grow. In relation to this case, Rangkuti (2001) stated that the position of growth is carried out by market penetration—that is, expanding market share through market development and product development efforts. Similarly, David (2009) argued that industries with competitive positions use intensive strategies through market penetration, market development, and product development. Referring to this position, the salted eggs agro-industries in Brebes Regency was likely to carry out a horizontal integration strategy by expanding the market while maintaining the quality.

Strategic positioning and pction evaluation (SPACE). The SPACE matrix was used to determine the most appropriate strategy for salted egg agro-industry. According to David (2009), SPACE Matrix is a four-quadrant framework called aggressive, conservative, defensive, or competitive strategies. The matrix focuses on financial strength and competitive advantage (as an internal factor) and environmental stability as well as industrial strength (as an external factor) to formulate a strategy (David, 2009). Based on the SPACE matrix analysis (Table 2.), salted eggs agro-industries in Brebes Regency is in an aggressive position, which is considered attractive and relatively stable agro-industries (Figure 2.).

A business activity with a marketing strategy is positioned on an aggressive strategy including developing unique products by applying high technologies and opening new markets (Dimitrova, 2017). According to Kotler and Armstrong (2012), in order to win competition in the market, it is necessary for an industry to add values of excellence and implement effective marketing strategies.

Grand Strategy Matrix. Grand Strategy Matrix is designed based on two dimensions of evaluation-competitive position (Lasalewo *et al.*, 2016) and market growth (Umar, 2008) as industrial competitive strategy-which is shown in Table 3.

The state of market growth showed that the average sales of salted eggs in Brebes was 13.12% compared to the sales in 2016 which was 4,420,110 and in 2017 which was 5,000,000 eggs. According to Umar (2008), market growth can be generated from different percentage between the increased and the decreased product volume selling at current time and previous time.

Based on the competitive profile of salted eggs agro-industries (Table 3) and market growth condition, Figure 3 was developed. Figure 3 shows that salted eggs agro-industries in Brebes Regency are in quadrant I. This means that that the salted eggs agro-industries were at a high level of competition and growth. According Lasalewo *et al.* (2016), Small medium enterprises (SMEs) in the competitive position and high market attractiveness together with a concentrated growth strategy as well as market and product development are the key to improve performance and to ensure long-term survival. Therefore, the grand strategy can be applied to the SMEs to determine short-term and long-term performance.

Salted eggs agro-industry was categorized as small scale industry, as its labors varied from 5 to 12 with a turnover of about IDR 57 million to 240 million. An industry is categorized as small when labors involved are around 5 – 19 people (Statistics Indonesia of Brebes Regency, 2018), and according to law no 20/2008 about criteria of Micro Small Medium Enterprises, the maximum turnover per year is maximum IDR 300 million.

Strategy Selection and Decision Making Stages. A strategy selected in relation to decision making was taken by evaluating alternative strategies based on internal and external factors weight (Table 1) with relative attractiveness

score (AS). The alternative strategy consisted of market penetration, product development, backward integration, and forward integration. The alternative strategy is presented in Table 4.

In Table 4, the QSPM (quantitative strategic planning matrix) shows that the score of market penetration strategy is 6.56, which indicated that market penetration could be selected as the grand strategy to be implemented in developing salted eggs agro-industries. However, market penetration strategy was a strategy required efforts to increase market share of products or services through bigger marketing efforts.

The policy strategy of market penetration is conducted by the many stages, i.e. increasing promotion to create brand image and agro-industry image through both printed and electronic media, increasing sales volume and market expansion, developing cooperation with government through business assistance programs. As salted egg has prominent national revenue, this strategy should be supported only by regional government, but also central government.

CONCLUSION

The production process of salted egg agro-industry was mainly supported by the availability of duck eggs and upstream agro-industry. Consumer's preference upon salted egg since it was fit to price, texture, and taste. The position of salted egg agro-industries in Brebes Regency are beneficial in relation to the strong external factors to maximize the strength of the internal factors, as its position was very strategic—being in aggressive and rapid growth positions. The best strategy for the best alternative concept for model development was market penetration, development, and product development.

SUGGESTION

The market penetration strategy was suggested to be the model for empowering salted egg agro-industry so that the good strategy upon the market penetration should be a domain in order to develop salted egg agro-industry in Brebes regency.

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ACKNOWLEDGMENT

We would like to deliver appreciation to LPPM Diponegoro University with Research Professorship Program for providing funds taken from the 2017/2018 UNDIP State Budget and also to Prof. Dr. Ir. Edy Kurnianto, M.S. M.Agr., for the assistance in research planning and manuscript writing.

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