

## Empowerment of siwalan roomie processing small and medium-sized enterprises (SMEs) through strengthening good manufacturing practice (GMP) in Tuban Regency

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### ABSTRACT

Siwalan merupakan tanaman sejenis palem yang merupakan salah satu komoditas pertanian unggulan di Kabupaten Tuban. Produksi siwalan mengalami peningkatan dari tahun ke tahun. Produksi yang melimpah memberikan potensi yang besar bagi petani siwalan dan kelompok usaha olahan siwalan untuk diversifikasi produk. Minuman legen dan buah siwalan dikenal sebagai produk oleh-oleh khas Tuban dan digemari oleh wisatawan lokal. Namun, beberapa masalah terkait kebersihan produk dan penyimpanan yang rendah menjadi tantangan bagi petani siwalan. Selama ini inovasi teknologi belum diterapkan pada pengolahan buah legen atau siwalan. Selain itu, pengembangan pemasaran masih terbatas dan belum mampu meningkatkan masyarakat lokal. Tujuan dari kegiatan ini adalah untuk mengkaji hubungan antara aspek sikap terhadap ketahanan pangan dengan aspek kinerja usaha dan pentingnya penguatan Good Manufacturing Practice (GMP). Hasil penelitian menunjukkan bahwa tidak terdapat hubungan yang signifikan antara aspek sikap terhadap keamanan pangan dengan aspek kinerja usaha. Temuan itu juga menegaskan bahwa aspek keamanan pangan diabaikan, terutama dalam proses produksi minuman legen. Beberapa produsen menambahkan bahan tambahan makanan untuk memperpanjang umur simpan legen. Praktik tersebut mempengaruhi cita rasa legen dan ketahanan pangan. Oleh karena itu, sosialisasi dan pelatihan terkait GMP merupakan faktor kunci untuk meningkatkan kinerja bisnis dan mencapai pembangunan berkelanjutan.

*Siwalan is palm type plant, which one of the prime agricultural commodities in the Tuban Regency. Siwalan production has increased from year to year. Abundant production provides great potential for siwalan farmers and groups of siwalan processed enterprises for product diversification. Legen drinks and siwalan fruit are known as typical souvenir products of Tuban and are favored by local tourists. However, some problems related to product hygiene and low storage are becoming the challenges for the siwalan farmers. So far, technological innovation has not been implemented on the processing of legen or siwalan fruit. Furthermore, the marketing development is limited and has not been able to enhance the local community. The purpose of this activity was to examine the relationship between aspects of attitude towards food security with aspects of business performance and the importance of strengthening Good Manufacturing Practice (GMP). The results showed that there is no significant relationship between aspects of attitude towards food safety with aspects of business performance. The findings also confirmed that the food safety aspect was ignored, especially in legen beverage production process. Some producers added food additives to extend the shelf life of legen. Such practice influenced the taste of legen and the food security. Therefore, socialization and training related to GMP is a key factor for improving business performance and achieving sustainable development.*

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## INTRODUCTION

Siwalan plant is a type of palm plant that grows in many coastal areas and is the main commodity of the Tuban Regency. Siwalan production increased from 7,086.45 tons in 2016 to approximately 7,140.76 tons in 2017 [1]. Abundant production provides great potential for siwalan farmers and the community who process siwalan into other processed products. Siwalan juice is one of the most widely used siwalan tree products. Siwalan juice contains 10-15 g / 100 cc of total sugar [2]. Sweet water from siwalan is processed into legen drinks and brown sugar. Siwalan fruit can be directly consume or used as an additional ingredient in siwalan fruit ice [3].

Legen and fresh siwalan fruit are typical souvenirs products from Tuban City. Both of these products are also favored by local tourists who visit Tuban [3]. Legen is another name for siwalan roomie which is tapped from siwalan flower buds [4]. In tapping process, the sap requires handling either before or after tapping. This is because roomie contains certain sugars (i.e. sucrose, glucose, fructose, and carbohydrates), the average pH of 6-7 and decent odour. If the sap is stored, the fermentation will occur by the presence of indigenous microorganisms in the sap, causing a sour taste due to the formation of acetic acid. Such condition can make the sap as a good medium for the growth of microorganisms such as bacteria, mold, and yeast [5], in which may change the taste of the legen. In addition, legen has been packaged in used mineral water bottle and sold on the side of main road. This raises problems of product's hygiene and the product's safety. Therefore, it is necessary to provide assistance and empower the siwalan roomie producers with Good Manufacturing Practice (GMP) to strengthen their knowledge and skill in the hygiene and the safety of legen products.

Food producers have relied on the use of GMP to ensure the food safety. GMP has become a basic requirement to be present before an effective Hazard Analysis and Critical Control Points (HACCP) system is implemented. This practice is adopted to prevent the pathogens contamination and to ensure a safe manufacture and distribution of food products. The implementation of food safety systems and the use of HACCP are now implemented in most food processing industries and food businesses [6]. The food processing industry must apply internationally accepted practices such as GMP and HACCP to achieve acceptable levels of quality and safety. Therefore, there is a need for the food processing industry to take stringent steps, comply with established food safety programs and guidelines and to implement a special system of control and activity assurance activities that help to realize and guarantee food safety [7].

This article discusses the influence of attitude aspect towards food security with aspects of business performance in siwalan legen production process at Small and Medium-sized Enterprises (SMEs) level. Also, this article explains the importance of empowerment and assistance to siwalan roomie processing SMEs in relation to GMP practices in the business activities. Therefore, this study

was aimed to to examine the relationship between aspects of attitude towards food security with aspects of business performance and the importance of strengthening GMP.

## **METHODS**

### ***Data collection***

The community empowerment activity in the Tuban area began with a survey to the owners of siwalan roomie processing SMEs in Semanding Sub-District. The results of this survey were used as a foundation and basic information for the researchers to map strategies in improving the production process and in assisting the GMP practices for siwalan roomie processing SMEs. During the survey, the data was collected by distributing questionnaires to the selected respondents (i.e. the owner of siwalan roomie processing SMEs) in the same districts. The questionnaires composed of two types of questions, include open and closed questions. In the closed questions, the Likert scale was used to rank the respondents responses, from 1 (strongly disagree) to 5 (strongly agree). Likert scale is one of the popular instruments to measure the latent nature of a variable consisting of a series of questions that are indicators of latency [8]. The open questions were used to explore the respondent's responses in regards to the legen production process and the business profile.

In addition, data collection using questionnaires was aimed to determine the effect of aspects of attitude towards food safety with aspects of business performance. In this regards, two variables were used include the attitude towards food safety and the business performance aspects. Each variable was breakdown in details into 12 and 5 questions, enabling researcher to obtain a comprehensive overview toward these two variables.

### ***Data analysis***

The linear regression method was employed to analyze the collected data. This method is widely used to determine the effect of one or several variables on one variable. This analysis is also able to show the direction of the relationship (i.e. positive or negative) between the dependent and independent variables [9]. This linear regression analysis was performed using SPSS 16.0 software. The hypotheses developed were as follows:

H0: there is no relationship between aspects of attitude towards food safety with business performance aspects

H1: there is a relationship between aspects of attitude towards food safety with aspects of business performance

## **RESULT AND DISCUSSION**

### ***Legen production process***

Survey related to siwalan roomie processing SMEs in Semanding Sub-District, Tuban Regency was conducted during the Kuliah Kerja Nyata Tematik – Doktor Mengabdi (KKNT-DM) period, in the villages of Panyuran, Boto, Tunah, Perunggahan, Manunggal, Tegalagung, Tegalebang, and Penambangan. As explained in the previous section, siwalan roomie or commonly known as legen is commonly found in the Tuban area, especially along the Pantura line. There are two type of legens available in the market include original (or pure) and mixed legen. The survey results showed that most of the legens sold on the side of main road of the northern coastline are mixed legen. Mixed legen is legen drink beverages with addition of some food additives materials such as water, sugar, vinegar, sweeteners, and jatu (derived from juwet fruit).

In legen production process, the technology and the equipment used were simple and still traditional (or conventional). The main equipment used is betek, which is a reservoir of siwalan sap made of bamboo, pipes, and large plastic bottles (Figure 1). In addition to betek, other tools required were buckets, dipper, pans, wedge, slap ropes, knives, funnels, bottles and jerry cans for packing the legen (Figure 2). In terms of food hygiene, it was evident that siwalan roomie processing SMEs did not comply with the GMP standard and practices. Such behaviors influenced not only the quality of legen, but also hindered the potential of market expansion. However, the study also found that many of siwalan roomie processing SMEs were still unaware of the GMP or HACCP standard for food processing. Therefore, certain measures and strategies are critically needed to overcome these challenges.



**Figure 1.** Bamboo Betek to store Siwalan roomie



**Figure 2.** Legen in bottles and jerry cans

The results of interviews showed that there are two group of *legen* production process as follows:

- Pure *legen* production

The process of pure *legen* production generally began with flanking the siwalan flowers (*wolo*) for 3-7 days. Then, *wolo* was thinly sliced and stored in bamboo or pipes *betek*. After that, siwalan roomie was taken twice a day i.e. in the morning around 5-7 a.m. and the afternoon around 3-5 p.m. Then, siwalan roomie was packaged in plastic bottles and jerry cans for consumption or sale. However, some siwalan roomie producers boiled the *legen* prior packaging into the bottle. However, this was carried out based on the request from the buyer. There were two option of storing the *legen* i.e. stored at room temperature or in fridge. If *legen* was stored in the fridge, it can last up to a week. If stored at room temperature, *legen* can only last for 12 hours or half a day. Otherwise, it becomes more acidic, and, at prolonged time, fermentation of *legen* is occurred, transforming sugar or acid into alcohol or wine.

- Mixed *legen* production process

Mixed *legen* is a pure *legen* which is processed by adding additional ingredients to improve taste and increase shelf life. Various additional ingredients can be added; however, most common ingredients added to make mixed *legen* were water and sugar with certain compositions. The first processing step for mixed *legen* is to boil the water, then followed by addition of sugar and siwalan juice. Boil the mixture for few minutes to ensure that sugar was completely dissolved. With this process, the mixed *legen* can last up to 6 months.

Some of *legen* drink products were directly packed for sale and some are undergo a further process. Most of the *legen* producers sold the *legen* and fresh siwalan fruit in front of their house along the side of main road. Siwalan fruit itself is obtained from a different tree from the siwalan tree which produces *legen*. Siwalan fruit is harvested from a female siwalan tree. Therefore, not all *legen* producers also produce fresh siwalan, but some of them got the fruit from other siwalan farmers and sell it together with *legen*.

So far, siwalan fruit is freshly sold either in peeled or unpeeled form, and packaged in plastic packaging. Nowadays, there is no products diversification are available from siwalan fruit on the market, therefore prospect and potential of siwalan processed products are high. On the other hand, some *legen* producers have processed *legen* into liquid sugar. However, some problems are remained as challenges in *legen* production process include short shelf life of legens and the product's hygiene. *Legen*, which is a superior product and a souvenir of Tuban, is expected to have a longer shelf life, thus the products can be taken out of town and can last in a longer period. In addition to improve the shelf life of legens, it is necessary to improve packaging, thus enabling to compete with other soft drink products available in the market. Also, by modifying the packaging type and design may have a positive impact on enhancing the selling price of *legen* and siwalan fruit, in which may contribute to increase the economic benefits obtained by siwalan roomie SMEs.

***The relationship between attitudes towards food safety aspect with business performance aspect and the GMP practices***

The results of statistical analysis in this study are shown in Table 1. The hypothesis can be tested based on the sig value of the independent variable, if the value is less than the probability value of 0.05, it can be concluded that the hypothesis (H1) is accepted. Table 1 shows that the sig value on the variable of attitude towards food safety aspects was 0.073 (> 0.05), indicating that the hypothesis (H1) is rejected. This means that there is no relationship between attitudes towards food safety aspects with business performance aspects. These results indicated that the attitude of SME owners towards food safety aspects during their production process was still low, as many of them ignored the food safety procedures and practices. This is consistent with the survey results that in producing legens, there are still many siwalan roomie processing SMEs that do not pay attention to the food security aspects.

**Table 1.** Correlation of the relationship between aspects of attitudes towards food safety and aspects of business performance

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	0.612	1.325		0.462	0.654
Attitude aspects of food safety	0.844	0.421	0.535	2.003	0.073

Note: dependent variable in this study was the business performance aspects

This study also shows that the awareness of the owners of siwalan roomie processing SMEs related to food security is still very low, thus they need support and assistance through strengthening the GMP. Currently, their knowledge levels of basic matters related to food safety has been quite good, but attitudes towards food safety during the production process are still disregarded. Besides, another aspect that is still overlooked is about the cross-contamination. Since the legen production process is quite simple (i.e. directly packaging after order was received), this makes some SMEs ignored the factor of food safety, especially cross-contamination. The survey results show that some SMEs directly packaged the legen / siwalan roomie soon after harvesting from the siwalan garden. Also, some of the SMEs have the siwalan garden next to a chicken or goat cage. Such condition indicated that their food safety awareness is still lacking as they do not pay much attention to potential cross-contamination that might occur. Therefore, training and community empowerment related to food safety are urgently needed to increase the awareness of the owners of siwalan roomie processing SMEs, as well as to encourage them to sustain the food safety practices. Sustainable food safety training does not only focus on theoretical aspects of knowledge, but also on the practical and on the positive attitude towards food safety, as well as on promoting good food safety practices [10].

Furthermore, the GMP becomes one of the most important tools to ensure that the production process is carried out to meet the specified standards, quality control measures are adopted adequately, and the products produced have acceptable quality before they are released for sale [11]. GMP is an important part of a quality management system to ensure product safety and effectiveness. The elements that make up GMP include facilities and surroundings, staff, cleaning and sanitizing processes, equipment, process and control, as well as storage and distribution. GMP aims to produce high-quality food ingredients because of the elimination of food-containing microorganisms and safe food from a public health perspective. GMP has been highlighted as one alternative ways to control foodborne diseases. Successful GMP implementation depends on managerial support, staff specialization, and motivation, resources, and program communication [12]. Therefore, to implement GMP in siwalan roomie processing SMEs in Tuban, the initial step to be taken is providing training and assistance to the SMEs related to the implementation of GMP in the legen production process. The existence of community empowerment, especially siwalan roomie processing SMEs through strengthening GMP is expected to encourage them to implement GMP sustainably towards sustainable manufacturing.

Community empowerment activities through strengthening the GMP began with socialization and training related to the importance of GMP in the legen production process. Furthermore, assistance provided is related to the implementation of GMP in the production process, starting from the equipment

used during the harvesting process, legen processing to legen packaging. Another aspect need to be assisted is in relation to the facilities/production sites, in particular cleaning and maintenance of the equipment. After harvesting, legen need to be packaged in a clean and sterile place to ensure a good quality of legen is achieved and to confirm the food safety aspect is not ruled out. Furthermore, sanitation on equipment and people also need attention. For the business actors / SMEs owners to implement GMP sustainably, the awareness and concern of SMEs owners regarding the importance of food security must always be embedded in their minds. Thus, enabling them to adhere to GMP guidelines and can sustainably implement GMP. If GMP can be implemented sustainably, the legen quality can be improved and this practice can also have an impact on the economy of the SMEs.

### ***Conclusion***

This study confirmed that attitudes towards food security of the siwalan roomie processing SMEs in Tuban were still lacking. However, statistical analysis results indicated that no significant effect of attitudes towards food security on business performance was observed. Yet, the survey findings demonstrated that food safety and food security procedures are mostly ignored by the SMEs during legen production process. GMP training and assistance are critically needed to help the SMEs in improving the legen quality. The findings also indicated that implementing GMP in business practices becoming an important factor to achieve sustainable development. Further in-depth study is needed to investigate the impact of GMP implementation on the economic benefits potentially obtained by the siwalan roomie processing SMEs

### **SIMPULAN**

The results showed that there is no significant relationship between aspects of attitude towards food safety with aspects of business performance. The findings also confirmed that the food safety aspect was ignored, especially in legen beverage production process. Some producers added food additives to extend the shelf life of legen. Such practice influenced the taste of legen and the food security. Therefore, socialization and training related to GMP is a key factor for improving business performance and achieving sustainable development.

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