

## APPLICATION OF FOOD TECHNOLOGY FOR MILK TO KEFIR FERMENTATION IN KANIA DAIRY FARMERS GROUP, TAJUR HALANG VILLAGE, CIJERUK SUBDISTRICT, BOGOR REGENCY

Rita Istiana<sup>a\*)</sup>, Annisa Wulan Agus Utami<sup>a)</sup>, Dina Dyah Saputri<sup>a)</sup>, Meilisha Putri Pertiwi<sup>a)</sup>, Suci Siti Latifah<sup>a)</sup>

<sup>a)</sup> Universitas Pakuan, Bogor, Indonesia

<sup>\*)</sup> Corresponding Author: rita\_istiana@unpak.ac.id

### Article history

Received 25 May 2019  
Revised 03 July 2019  
Accepted 02 August 2019

### Abstract

Bogor regency is the 5th milk production area with 2,94% per year of cattle growth. One of milk production areas is in Tajur Halang Village, Cijeruk Subdistrict, Bogor Regency. It also already had Kania dairy farmers group to process the milk. The area has conducive climate and proper geographic for cattle livestock. Milk is very sensitive towards physical and microbe influence. It also susceptible against milk damage. It inflicts lowness of milk storage. Now, food technology development has an alternative for milk processing. It can diverse milk product and lengthen milk storage time. One of the technologies is milk fermentation. Milk fermentation has a few good benefit and savor for body. Contained lactose in milk will be broken into more simple compound by fermentation, so for those –lactose intolerances- can still enjoy the milk. Kefir is a product of this milk fermentations. The aim of our community service activity was to socialize application of food technology for milk to kefir in Kania Dairy Farmers Group in Tajur Halang Village, Cijeruk Subdistrict, Bogor Regency. The Kania Group was trained by trainer, lecturers of Biology Education Department, FKIP UNPAK and also discussed each other. It maximised Kania Group in making innovation of kefir fermentation products. In addition, it developed livestock product variety and socialized its nutrition. Hopefully, it can increase community income by selling this product.



JCe is licensed under a CC BY-NC 4.0 International License.

**Keywords:** fermentation, milk, kefir.

### I. INTRODUCTION

Livestock product development is a part of strategic economy development. It can fulfil food necessity that always increase because of increasing people number. Besides that, it can increase people/community income and create job vacancy. It has a big support by high potency of natural resource for livestock and farming development.

Potential livestock agribusiness to develop is ruminantia agribusiness like goat and cattle. Ruminant animal has a high market product relates to increasing people necessity recently. Culture and custom also support its high demand. Hopefully, ruminant animal can fulfil people protein necessity.

West Java Feterinary Agency [1], stated that Bogor Regency is the fifth milk production area. The others are Bandung, Garut, Kuningan, and Sumedang. Bogor Regency has a good potency for dairy cattle livestock. It is supported by increasing of dairy cattle population every year. Average of its population is 2,94% per year (Sinambela [2]). Its potency can create

job vacancy, increase community income, and fulfil community nutrition.

One of developed dairy cattle livestock areas in Bogor Regency is Tajur Halang Village, Cijeruk Subdistrict. This area already has dairy farmers groups named KANIA. This area has conducive climate and geographic like livestock's food availability. The fresh air is also a proper factor for dairy cattle livestock (Sinambela [2]).

Livestock has various commodity like chicken, duck, goat, sheep, pig, and cattle. Each of them has role in fulfilling nutrition like protein, fat, calory, and vitamin. People's knowledge about nutrition makes them consume high nutrition food. Milk is an example. In advantage, milk has a complete nutrition.

Milk has almost perfect nutrition. It's very sensitive towards physical and microbe influence. It also susceptible against milk damage. It inflicts lowness of milk storage. Now, food technology development has an alternative for milk processing. It can diverse milk product and lengthen milk storage time. One of the technologies is milk fermentation.

Milk fermentation has a few good benefit and savor for body. Contained lactose in milk will be broken into more simple compound by fermentation, so for those – lactose intolerances- can still enjoy the milk.

Kefir is one of popular milk fermentations nowadays. Kefir contains 0,5—1% alcohol and 0,9—1,11% (Rahman [3]). Kefir's milk is made from cattle milk, goat milk, or sheep milk that added kefir granule or seed as the starter (Kosikowski and Mistry[4]). Indonesian tends to like kefir because of its benefit. It is believed empirically to prevent and cure various diseases like heart, kidney, lung, liver and also decrease cholesterol, increase appetation, and make body more powerfull and fresh. Kefir is also used to cure acnes by making kefir mask (Firdausi [5]).

Kefir fermentation yields water for milk processing, meanwhile the rest is packaged into facial mask. Madigan [6] researched that kefir product can prevent Propionobacterium acnes, bacteria causing acnes. It is proved that kefir mask has potency become cosmetic product besides milk product. Both of them have economic value for community.

#### **Activity Purpose**

The aim of our community service activity was to socialize application of food technology for milk to kefir in Kania Dairy Farmers Group in Tajur Halang Village, Cijeruk Subdistrict, Bogor Regency. Then discussion between trainer and community.

## **II. METHODS**

#### **Location and Time**

Community Service Activity was done from December 2017 to March 2018. The location was in Tajur Halang Village, Cijeruk Subdistrict, Bogor Regency.

#### **Method**

The activities consisted of presentation and direct kefir production training. The procedures were:

1. Explanation about development of food industry and the other products based on food microbiology
2. Discussion between trainer and community
3. Kefir milk fermentation experiment and monitoring the result
4. Questionnaire
5. Data analyse

#### **Procedure**

Based on Astuti and Andang [7], cow's milk component of kefir making used whole milk and skim milk (milk without fat). It pasteurized at 85°C for 30 minutes. Then each of whole milk and skim milk is poured into 600 ml bowl. After that, milk's temperature will decrease to 22-28°C. 5% of kefir starter is inoculated into milk and close the bowl using cling wrap. So it's ready to incubate in 22-28°C

temperature for 30 hours. At last, it is filtered. The rest of granules can be washed using raw water for making new starter.

## **III. RESULTS AND DISCUSSION**

Training of kefir product making was followed by 35 women of Kania Dairy Farmers Group. The socialization was done in the end of December 2017. The training was done on Sunday, February 4<sup>th</sup> 2018, started from 8 am to 3 pm. After training, we did monitoring twice. First one was seeing kefir processing result on Monday, February 5<sup>th</sup> 2018. Second one was mass production of kefir product and packaged into small bottle for selling on March 3<sup>rd</sup> 2018.

The rundown was:

- a. Explanation about fermentation definition, fermentation product, kefir fermentation processing as a way to increase economic and nutrition value
- b. Working group  
Members of Kania dairy farmers group were divided into 5 groups. Each of groups was guided by two trainers
- c. Experiment
  1. Prepare fresh cattle milk as material
  2. Pasteurize the milk by boiling it up to 70 ° C temperature [8]
  3. Let the milk temperature down (25 ° C)
  4. Adding 50 g kefir granules/ 1 L milk
  5. Saving the milk inside glass jar in dark condition (incubation for 30 hours)
  6. Filtering kefir milk
  7. Kefir milk is ready to drink. It may be added sugar or various flavor.
  8. The rest of solid kefir can be used as mask by smearing smoothly on face. Wait for 30 minutes, then rinse it using water
- d. Discussion between trainers and community
- e. Giving reward for the best group

The most abundant of livestock product is fresh cattle milk. So far, it consumed directly or processed it into yogurt. Therefore, members of Kania were so enthusiastic joining the training. For them, kefir milk fermentation product is an innovation in cattle milk processing (Figure 1).



Figure 1. Training of kefir milk fermentation

Besides kefir milk, the rest of solid kefir can be used as mask. So we can enjoy directly the kefir milk and also do treatment to our face. This innovation has

economic and nutrition value for community (Figure 2).



Figure 2. Kefir milk fermentation product

The data in Table 1 was taken by questionnaire to Kania's members. It talked about characteristic of respondent's response.

Table 1 Characteristic of respondent's response

Description	Total
Questionnaire distribution	35
Returned questionnaire	31
Not returned questionnaire	4
Not complete/broken questionnaire	2
Processed questionnaire	29

Based of above table, we losted 6 questionnaires. So, the total of questionnaire that represent the population was 29 respondents.

The questionnaire's content is shown in Table 2

Table 2 Characteristics of respondent's response towards Kefir training in order to increase family income

No	Variable	Yes	No	Total
1	Kefir milk and mask processing from milk is usefull in increasing family income	26	3	29
2	There are a few obstacles in kefir product processing	9	20	29
3	The training which is done by lecturers of FKIP Unpak gives influence and benefit for community empowerment	29	0	29
4	Despite training has finished, community is still continue this program	26	3	29
5	Community is still want to cooperate with FKIP Unpak in guiding fermentation products making	29	0	29

Based on Table 2 there were 29 respondents who gave response towards kefir product making. 26 respondents were agree that milk processing into kefir milk and mask is very useful in increasing family income. It means kefir products are innovation and also it increases selling point.

There were 20 respondents who didn't agree with obstacles when doing kefir product processing. It indicates that kefir product is easy to apply as home industry. Meanwhile, there were also 9 respondents felt the obstacles. They thought about how difficult to get kefir starter. Nonetheless, respondents didn't have something to worry about. Lecturers of FKIP Unpak gave kefir starter for the training and they can renewal the starter.

The activity gave influence and benefit for community empowerment has 29 respondents that agree on it. Kania's members were getting new knowledge for cattle milk processing instead of directly consumed. Because of that, 26 respondents agree to continue it even though the guided program has ended. Moreover, they have big chance to product marketing. Lastly, 29 respondents or all the respondents still want to have well cooperate with FKIP Unpak in guiding fermentation product processing. They hope the next program will about packaging and marketing.

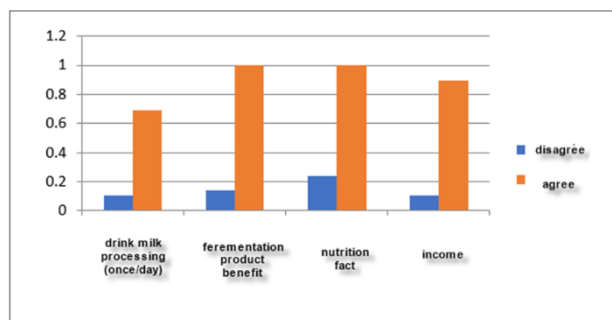


Figure 3. Community response before and after fermentation product training

Based on Figure 3, 20 of 29 respondents drink milk processing like yogurt and kefir at least once per day. Commonly, community knows about its nutrition for health and supplement for children. All respondents agree that they get new knowledge about fermentation product processing after explanation from lecturers of FKIP Unpak. Kefir has benefit for decresing cholesterol, softening face skin, and lowering body weigh. In addition, there were 26 respondents agree that fermentation products have a higher rate than pure cattle milk it self. Unfortunately, the products are still locally marketed because of simple packaging and marketing. So, we need to make it advance

#### IV. CONCLUSION

Community service program in Tajur Halang Village, Cijeruk subdistrict, Bogor regency has succed

to empower the community especially Kania dairy farmers group. The community were getting new knowledge about cattle milk processing to kefir milk and mask so they can make various products instead of directly consumed. They also now about its nutrition and increase their income by well marketing.

### **Suggestion**

There are some suggestions for the activity:

- a. The community especially Kania members are in need to intensively guided and so they make it as good home industry.
- b. There should be more training about packaging and marketing.

### **REFERENCES**

- [1] Badan Pusat Statistik Kecamatan Cijeruk, Kabupaten Bogor. 2016. CV. Prima : BPS Kabupaten Bogor
- [2] Sinambela D. 2013. *Analisis Kelayakan Usaha Sapi Perah Kelompok KANIA Di Desa Tajur Halang, Kecamatan Cijeruk, Kabupaten Bogor*. Bogor : Institut Pertanian Bogor.
- [3] Rahman, A., Fardiaz, S., Rahaju, W. P., Suliantari, dan Nurwitri, C. C. 1992. *Bahan Pengajaran Teknologi Fermentasi Susu*. Pusat Antar Universitas Pangan dan Gizi. Institut Pertanian Bogor.
- [4] Kosikowski, F. dan Mistry, V. V. 1982. *Cheese and Fermented Milk Foods* 3rd Edition. F. V. Kosikowski and Associates. New York.
- [5] Firdausi, D., Saifudin, A. Y., dan Haryono, D. P. 2010. *Kristal Algae Sebagai Obat Alternatif Penyembuhan Kanker Kolorektal*. <http://www.lipi.go.id/kompetisi/kompetisi.cgi?ringkasan&1271731966&1278996981&2010>. 21 Mei 2018.
- [6] Madigan, M. T., Martinko, J. M., dan Parker, J. 2000. *Brock Biology of Microorganisms*, 9th Edition. Prentice-Hall Inc. New Jersey.
- [7] Astuti D, Herawati, Andang A A. 2006. *Pengaruh Konsentrasi Susu Skim Dan Waktu Fermentasi Terhadap Hasil Pembuatan Soyogurth*. Jurnal Ilmiah Teknologi
- [8] P. Citreksoko and Y. Suchyadi, *Kimia Terapan*, 01 ed. Jakarta: Universitas Terbuka, 2012.