

Research article

Healthy Eating Promotion via Food Stalls in Chiang Mai University

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ABSTRACT

Trending of non-communicable diseases (NCDs) in Thailand, including diabetes, high blood pressure, and coronary heart disease etc. is higher than in the past. These diseases occupied a percentage of 75.2 of all mortality rates in 2013. Poor consumption behavior is one of the main causes of these chronic diseases. Only 25.9 percent of Thai adults get their sufficient daily fruit and vegetable consumption and the consumption of sugar was three times over the recommendation per day. Moreover, fat and salt consumption were twice over the maximum appropriate amount. This problem must be resolved urgently. To study knowledge and food consumption behavior of food stalls owners and then develops the healthy food selling system in Chiang Mai University. Materials used in this study were 3 questionnaires included questionnaire for knowledge and consumption behavior of food stall owners, questionnaire for satisfaction and opinion about the healthy food selling of consumers and questionnaire for satisfaction and opinion about the healthy food selling of food stall owners. This was action research planned into four stages that plan, educate, observe and evaluate the healthy food selling system developed. There were 38 food stalls owners participate in healthy food selling. The result of satisfactory of food stall owner, 55.3 percent agreed that this project should be continued at the highest level. Food stall owner very agreed (55.3 and 44.7 percent) that they gained more knowledge about healthy food consumption and this project has resulted in more attention to consumer's health respectively. Moreover, 55.3 percent of food stall owners totally agreed that there is a change in their cooking behavior. For consumer's opinion survey, 51.3 percent had the highest level of agreement that this project should be continued. 52.2 percent of consumer totally agreed that healthy food according to this project is good for their health and resulting in their health attention through healthy eating. After finishing this action research, there was healthy eating promotion at Chiang Mai University by improving food environment. Most of healthy food sellers and consumers satisfied the project. For going on health promotion in the university, the next step should be giving knowledge about healthy eating to consumers. So healthy food eating would be sustainable leading to lower risk of chronic non-communicable diseases.

Key words: Healthy food, Chiang Mai University, Health promotion, Food stall, Healthy eating.

Received: 25 May 2019

Accepted: 23 November 2019

Available online: 27 November 2019

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บทความวิจัย

การส่งเสริมการบริโภคอาหารเพื่อสุขภาพผ่านร้านอาหารในมหาวิทยาลัยเชียงใหม่

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บทคัดย่อ

สถานการณ์โรคไม่ติดต่อเรื้อรังในประเทศไทยในปัจจุบันมีแนวโน้มเพิ่มสูงขึ้นอย่างมากจนเข้าขั้นวิกฤติ โดยสถิติการเสียชีวิตจากกลุ่มโรคนี้ในปีพ.ศ. 2556 คิดเป็นถึงร้อยละ 75.2 ของสถิติการเสียชีวิตทั้งหมด พฤติกรรมการบริโภคที่ไม่เหมาะสมเป็นปัจจัยหนึ่งของปัญหาดังกล่าว ประชากรไทยอายุ 15 ปีขึ้นไป กินผักและผลไม้เพียงพอตามข้อแนะนำเพียงร้อยละ 25.9 มีการบริโภคน้ำตาลมากถึง 3 เท่าของปริมาณที่แนะนำต่อวัน และบริโภคไขมันและเกลือมากกว่าที่ร่างกายต้องการถึง 2 เท่าต่อวัน ซึ่งเป็นพฤติกรรมการบริโภคที่ควรได้รับการปรับเปลี่ยนให้เหมาะสม งานวิจัยชิ้นนี้ มีวัตถุประสงค์เพื่อศึกษาความรู้และพฤติกรรมการบริโภคอาหารของเจ้าของร้านอาหารในมหาวิทยาลัยเชียงใหม่ รวมทั้งพัฒนาระบบการจำหน่ายอาหารเพื่อสุขภาพขึ้นภายในมหาวิทยาลัยเชียงใหม่ เครื่องมือที่ใช้ประกอบด้วย แบบสอบถามความรู้เกี่ยวกับอาหารเพื่อสุขภาพและพฤติกรรมการบริโภคอาหารของเจ้าของร้านอาหารในมหาวิทยาลัยเชียงใหม่ แบบประเมินความพึงพอใจเกี่ยวกับการจำหน่ายอาหารเพื่อสุขภาพสำหรับผู้บริโภค และแบบประเมินความพึงพอใจเกี่ยวกับการจำหน่ายอาหารเพื่อสุขภาพสำหรับเจ้าของร้านอาหาร งานวิจัยชิ้นนี้เป็นงานวิจัยเชิงปฏิบัติการ แบ่งออกเป็น 4 ระยะ คือ ระยะวิเคราะห์สถานการณ์ ระยะลงมือปฏิบัติ ระยะสังเกตการณ์ และระยะประเมินผล ผลการศึกษาพบว่า มีเจ้าของร้านอาหารจำนวน 38 ร้านเข้าร่วมโครงการจำหน่ายอาหารเพื่อสุขภาพ และเจ้าของร้านอาหารจำนวนร้อยละ 55.3 เห็นด้วยในระดับมากที่สุดว่าโครงการนี้ควรมีการดำเนินงานต่อไป เจ้าของร้านอาหารเห็นด้วยในระดับมากที่สุดว่าโครงการนี้ทำให้ได้รับความรู้เกี่ยวกับอาหารเพื่อสุขภาพมากขึ้น และส่งผลให้ใส่ใจในสุขภาพของผู้บริโภคมากขึ้น ร้อยละ 55.3 และ 44.7 ตามลำดับ นอกจากนี้ร้อยละ 55.3 ของเจ้าของร้านอาหารเห็นด้วยมากกว่าโครงการนี้ทำให้เกิดการเปลี่ยนแปลงพฤติกรรมการปรุงอาหารจำหน่าย สำหรับความคิดเห็นของผู้บริโภค ร้อยละ 51.3 มีความเห็นในระดับมากที่สุด ว่าโครงการนี้ควรมีการดำเนินงานต่อเนื่องต่อไป ร้อยละ 52.2 มีความเห็นในระดับมาก ว่าอาหารเพื่อสุขภาพตามโครงการนี้ส่งผลดีต่อสุขภาพ และส่งผลให้เกิดการดูแลสุขภาพผ่านการกินอาหารที่ดีต่อสุขภาพ หลังจากงานวิจัยเสร็จสิ้น ทำให้มีการส่งเสริมให้เกิดการบริโภคอาหารเพื่อสุขภาพขึ้นในมหาวิทยาลัยเชียงใหม่ โดยการปรับเปลี่ยนสิ่งแวดล้อมด้านอาหาร ซึ่งเจ้าของร้านอาหารและผู้บริโภคส่วนใหญ่พึงพอใจกับโครงการ และควรมีการพัฒนาต่อไปในอนาคต เพื่อให้เกิดการส่งเสริมสุขภาพ และลดความเสี่ยงต่อการเกิดโรคไม่ติดต่อเรื้อรัง

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Introduction

Nowadays, trending of non-communicable diseases (NCDs) in Thailand, including diabetes, high blood pressure, and coronary heart disease etc. is higher than in the past. These diseases occupied a percentage of 75.2 of all mortality rates in 2013^{1,2}. Poor consumption behavior is one of the main causes of these chronic diseases. Healthy consumption recommendations by Ministry of Public Health of Thailand are to consume sugar and fat, not more than 6 teaspoons a day, and salt not more than 1 teaspoon a day³⁻⁶. In addition, a minimum of 400 grams of fruits and vegetables per day are recommended³⁻⁷. But only 25.9 percent of Thai adults get their sufficient daily fruit and vegetable consumption. The consumption of sugar was three times over the recommendation per day. Moreover, fat and salt consumption were twice over the maximum appropriate amount⁸⁻¹⁴.

There are some strategic plans for chronic diseases reduction in Thailand such as Thailand lifestyle healthy strategic plan, National action plan for overweight and obesity and Strategy for salt and sodium consumption reduction in Thailand. Chiang Mai University also aims to be a green and healthy university. Health of students and workers of Chiang Mai University are concerned, so there is also approach strategy plan to be a healthy university. To follow the strategy, this study was an action research for studying knowledge and behavior of food stall owners and then developed the healthy food selling system in Chiang Mai University

Materials and methods

Materials used in this study were 3 questionnaires included questionnaire for knowledge and consumption behavior of food stall owner, questionnaire for satisfaction and opinion about the healthy food selling of consumers and questionnaire for satisfaction and opinion about the healthy food selling of food stall owners. Questionnaire for knowledge and consumption behavior of food stall owner was constructed based on some surveys from the Ministry of Public Health, Thailand¹⁵⁻²⁰. All three questionnaires were evaluated by three nutritional experts. The item-objective concurrence indexes (IOC) of all questionnaires were higher than 0.95. Then all questionnaires were tried out with twenty subjects so Cronbach's alpha coefficient of questionnaire for knowledge and consumption behavior of food stall owner, questionnaire for satisfaction and opinion about the healthy food selling of consumers and questionnaire for satisfaction and opinion about the healthy food selling of food stall owners were 0.79, 0.90 and 0.70 respectively.

This action research was planned into four stages.

First action: Questionnaire for knowledge and consumption behavior of food stall owners was used to collect the data for the first stage. The owners were asked to participate in this study willingly.

Second action: Owners who voluntarily join the study were educated about healthy

consumption to motivate them minded in cooking healthier food for consumer.

Third action: Food stall owners selected one menu to be a healthy menu of their own. The menu must be less sugar, fat or salt and more vegetable or fruit as an option. Then there is “Healthy food Good Health” sign (**Figure 1**) for the food stall which healthy menu was sold. These healthy menus were advertised in social media and handbill.

Last action: Satisfaction and opinion about the healthy food selling of both consumers and food stall owners were asked using a satisfactory questionnaire.



Figure 1 “Healthy food good health” sign

Results

From all 139 specified food stalls in Chiang Mai University, There were 82 stalls in 11 faculty of Chiang Mai University voluntarily replied the questionnaire in the first action. Characteristics of the participants were shown in **Table 1**.

Knowledge about healthy food of food stall owners in Chiang Mai University was shown as a percentage of correctly and incorrectly answers of participants. The participants were ask to choose true or false of 20 questions about healthy food. The results

were shown in **Table 2** sorting from the most to the least correct answer. There were 17 questions that more than 50 percent of participants can answer correctly

Consumption behaviors of the participants were shown separately into positive and negative behavior. Positive behaviors were shown in **Table 3** and **Figure 2** which participants performed at the highest frequency (17 – 21 meals per week) from the highest to the least. Negative behaviors were shown in **Table 4** and **Figure 3** which participants performed at the lowest frequency (0 – 4 meals per week) from the highest to the least.

There were 38 food stall owners participated in healthy food selling project. Consumers can inspect the healthy food selling food store by “Healthy food good health” sign (figure 1) in front of the food stall. The result of satisfactory of food stall owners, 55.3 percent agreed that this project should be continued at the highest level. Percentage of 55.3 and 44.7 of food stall owner were very agreed that they gained more knowledge about healthy food consumption and this project has resulted in more attention to consumer’s health respectively. Moreover, 55.3 percent of food stall owner totally agreed that there is a change in their cooking behavior.

For consumer’s opinion survey, 51.3 percent of 113 consumers had the highest level of agreement that this project should be continued. 52.2 percent of consumer totally agreed that healthy food according to this project is good and resulting in their health attention through healthy eating. Some consumers give an opinion that there should

have more varieties of healthy food menus and promotion.
should have more project publicity and

Table 1 Characteristics of the participants

Characteristics	Number	Percentage
Sex		
Male	16	19.5
Female	66	80.5
Age (year) (Mean, SD)		
		43.4, 10.8
Education		
Primary school	8	9.8
High school	19	23.1
Vocational certificate	12	14.6
Bachelor degree	40	48.8
Higher than Bachelor degree	3	3.7
Duration of food selling (Median, IQR)		
		6.5, 3.8 – 12.5
Type of food sold		
A la carte	29	25.4
Entrée over rice	18	15.8
Noodle	17	14.9
Beverage	24	21.1
Snack	17	14.9
Fruits	9	7.9
Body Mass Index		
(Mean, SD)	Male	26.3, 3.5
	Female	24.5, 4.9

**Table 2** Percentage of correctly and incorrectly answers of each question.

Questions	Answer correctly (Percent)	Answer incorrectly (Percent)
1. Boiled, steamed, grilled, baked or stewed dishes should be eat instead of fried foods.	96.3	3.7
2. Pig skin, duck skin, chicken skin have less fat, we can eat in unlimited amount.	95.1	4.9
3. Egg yolks, entrails and seafood contain high cholesterol.	93.9	6.1
4. MSG and soup cube have no salt, can be eaten in unlimited quantities	93.9	6.1
5. Eating too much sugar for a long time can cause high blood sugar followed by diabetes	92.7	7.3
6. Brown rice has high fiber and less sugar than polished rice.	89.0	11.0
7. Eating too much sugar make you fat	87.8	12.2
8. People with high blood cholesterol should avoid using palm oil due to high saturated fat.	84.1	15.9
9. Eating fruits and vegetables helps prevent fat accumulation at the blood vessels.	84.1	15.9
10. Eating enough fruits and vegetables will help reduce the risk of chronic non-communicable diseases	82.9	17.1
11. In 1 day, do not eat more than 6 teaspoons of oil or fat.	81.7	18.3
12. All fruits have low sugar, can be eaten in unlimited quantity.	78.0	22.0
13. Eating too much salty food causing the risk of hypertension.	76.8	23.2
14. Eating fermented foods or processed foods does not cause the risk of hypertension	72.0	28.0
15. Eating unsweetened fruits and vegetables at least half a kilogram per day is recommended.	68.3	31.7
16. You should use vegetable oil instead of animal oil for cooking.	56.1	43.9
17. On the nutrition label, the amount of food consumed per sachet is equal to 2, meaning that in 1 sachet should be divided into 2 times eating.	54.9	45.1
18. You should eat at least 1 ladle of fresh vegetables.	23.2	76.8
19. In 1 day, do not eat more than 8 teaspoons of sugar.	22.0	78.0
20. In 1 day, do not eat more than 5 teaspoons of salt.	14.6	85.4

Table 3 The frequency of positive consumption behaviors of the participants.

Positive behaviors	Frequencies in percent (Meal per week)				
	0 – 4	5 – 8	9 – 12	13 – 16	17 - 21
1. Read nutrition labels before choosing to buy food	19.5	15.9	19.5	12.2	32.9
2. There are vegetables in a half of every meal.	19.5	18.3	23.2	19.5	19.5
3. Choose to eat fresh, unsweetened fruit as a snack instead of sweets or other snacks	26.8	25.6	23.2	8.5	15.9
4. Choose to eat vegetables in various colors in each meal	31.7	28.0	23.2	3.7	13.4
5. Not add sugar when eating at restaurants	59.8	15.9	6.1	6.1	12.2
6. Eat boiled, steamed, or baked food	23.2	26.8	24.4	14.6	11.0
7. Eat 2 ladles of fresh vegetables per meal	39.0	18.3	20.7	11.0	11.0
8. Cook without using MSG, seasoning powder, or cube soup	46.3	26.8	13.4	3.7	9.8
9. Eat 1 portion (about 6-8 pieces) of fresh, not sweet fruit in a meal	46.3	18.3	19.5	6.1	9.8
10. Not add fish sauce or seasoning sauce when eating food	47.6	26.8	11.0	7.3	7.3
11. Limit the amount of dipping sauce in foods such as meatballs, chicken rice, suki or BBQ	58.5	22.0	11.0	3.7	4.9

Discussion

When positive consumption behavior (**Table 3**) was considered together with negative consumption behavior (**Table 4**), mostly of food stall owners avoided negative behaviors as well but performed positive behaviors in low frequency. It shows that they had good practice at consumption behavior which correlated well with knowledge about

healthy food consumption (**Table 2**). Less frequent of positive behaviors may be related to other factors such as a hectic lifestyle, less access to healthy food and easy access to junk food (online and delivery marketing) as mentioned in the study of Institute for Population and Social Research, Mahidol University¹².

**Table 4** The frequency of negative consumption behavior of the participants.

Negative behaviors	Frequencies in percent (Meal per week)				
	0 – 4	5 – 8	9 – 12	13 – 16	17 - 21
1. Eat Thai sweets such as Thongyib, Thongyod	86.6	9.8	3.7	0	0
2. Eat fatty meats	85.4	12.2	0	1.2	1.2
3. Eat fermented or processed foods such as pickled vegetables, pickled fruits, salted meat, salted fish, salted eggs, etc.	82.9	13.4	1.2	2.4	0
4. Eat food or sweets prepared with coconut milk	81.7	14.6	2.4	1.2	0
5. Eat fried foods such as fried meatballs, fried chicken, French fries, etc.	79.3	14.6	6.1	0	0
6. Eat instant foods such as noodles, porridge etc.	72.0	20.7	4.9	2.4	0
7. Drink sweet drinks such as sparkling water, fruit juice, etc.	70.7	14.6	7.3	7.3	0
8. Eat sweet fruits such as ripe mangoes, durian, jackfruit, rambutan, etc.	67.1	22.0	9.8	0	1.2
9. Drink sugary drinks such as coffee, milk tea, cocoa green tea etc.	52.4	29.3	9.8	3.7	4.9
10. Cook using palm oil or lard	42.7	25.6	18.3	7.3	6.1

From the result of satisfactory of food stall owners showed that 55.3 percent of food stall owners agreed that they gained more knowledge about healthy food consumption and there was a change in their cooking behavior. A previous study confirmed that education program can effect in consumption knowledge and behavior score increasing statistically significant at 0.001²¹. However, the study of Suksrithong²² showed that healthy cooking behavior has many factor involved including education level, environment and

reinforcement. Therefore, to promote better healthy food cooking in food stall, environmental supporting as well as motivating of the owner is needed

For healthy food selling sustainability, the most important factor may be the consumer as a demand supply balancing²³. There were some comments from the questionnaires of food stall owners that not many consumers changed their eating habit. So they would like the project to educate consumers on healthy eating and more public relation of their healthy

food selling is needed. The next project continuous to this study should concern in consumer attention in their healthy consumption. Nevertheless changing in consumer behavior may have many factors involved such as sex, age, knowledge, attitude, and believe as mentioned by a study in Chonburi²⁴. In addition, the consumption behavior study in North-East of Thailand²⁵ indicated that there were nine factors influence eating behavior including age, education level, career, marital status, nutritional status, knowledge, attitude, information receiving and

contributing factors related to food consumption.

The results from satisfactory survey of food stall owners and consumers showed that most of them agreed to continue this project. Previous studies^{23, 26} showed that healthy food selling providing quality lunch is one way to promote student healthy food consumption and increasing healthy food access was a significant impact in eating behavior change leading to health promotion by environmental changing.

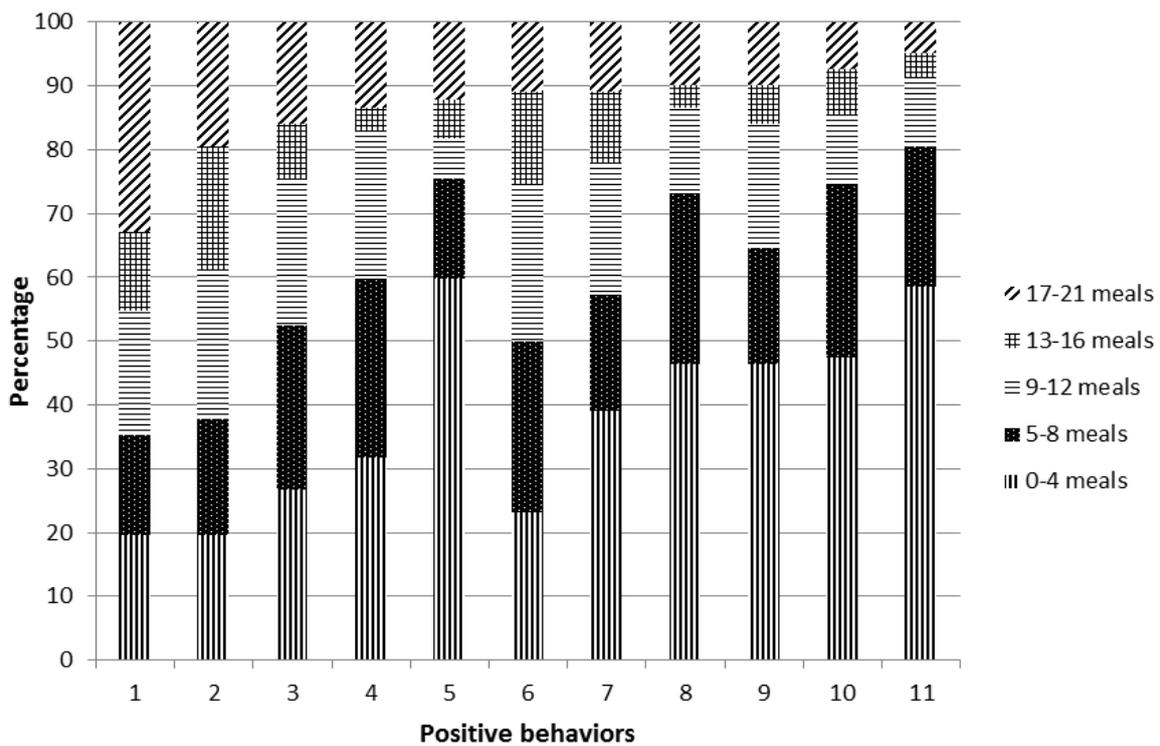


Figure 2 The percentage of frequency of positive consumption behaviors of the participants (meals per week).

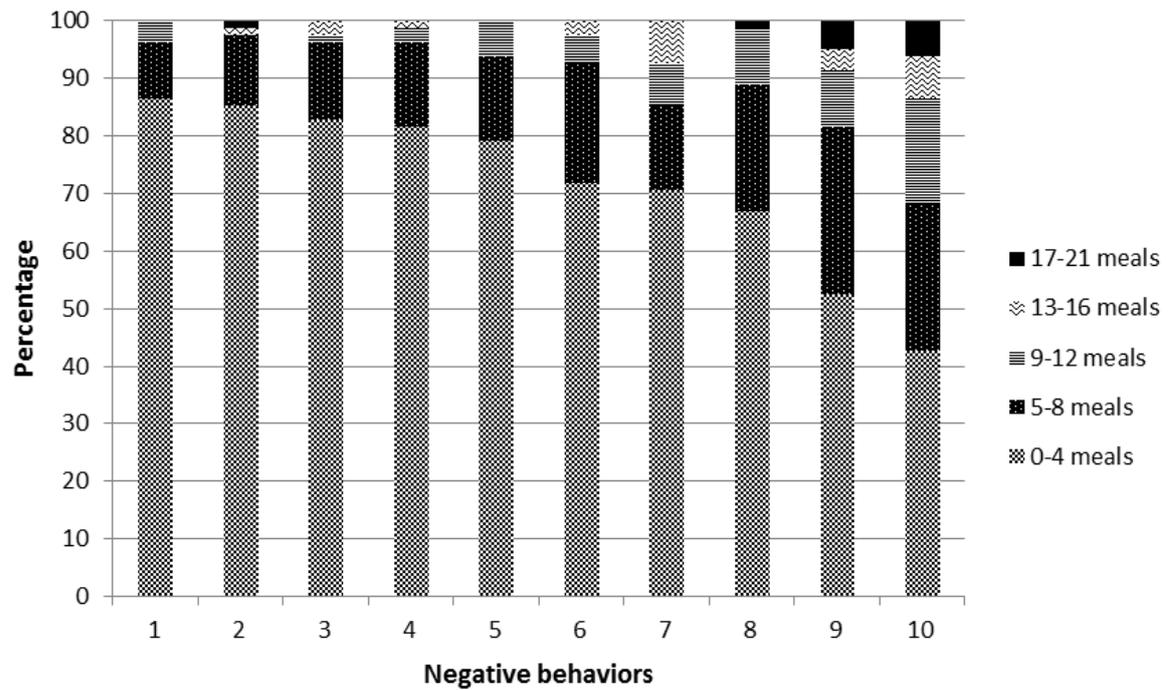


Figure 3 The percentage of frequency of negative consumption behaviors of the participants (meals per week)

Conclusion

Finally, there was a healthy eating promotion program at Chiang Mai University by improving food environment. Most of healthy food sellers and consumers satisfied this project. For going on health promotion in the university, the next step should be giving knowledge about healthy eating to consumers. So healthy food eating program can be sustainable and chronic non-communicable diseases can be prevented.

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