

A Study on the Measures to Commercialize Regional Cuisines for the Activation of Rural Convergence Industry

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Abstract

Objectives: The purpose of the present study is to propose diverse cuisines that meet consumption trends utilizing regional specialties for the activation of rural convergence industries utilizing tomatoes as a main material. **Methods/Statistical Analysis:** The cuisines for the present study were made using self-produced food materials that does not require much manual work while enabling experience considering surrounding conditions. In addition, health, in-season materials, and diet were considered, mainly one-dish meals and snacks made using cooking methods such as baking, steaming, low-salt, and vegetarian diet were developed, and the prices were planned to be around 5,000~10,000 won. The cuisines made utilizing tomatoes were finally selected through sensory evaluation. **Findings:** Tomato with spaghetti, tomato topped pizza, tomato steamed bun, tomato with curry, tomato stuffed fried rice, tomato topped baguette, and fried tomatoes were selected as cuisines made utilizing tomatoes, the recipes of individual cuisines were presented on the basis of four servings, and this tomato dishes nutritional contents per serving were examined. According to the results of a questionnaire survey on the intake frequency of cuisines utilizing tomatoes, most of the survey subjects were shown to eat such cuisines at least once per week and according to the results of sensory evaluation, tomato topped baguettes showed the most positive responses in tastes, sugar content, texture, and overall satisfaction. Tomato steamed buns did so in flavor, and fried tomatoes did so in tomato scent. Tomato topped baguettes showed the highest overall satisfaction with M=4.43 followed by fried tomatoes(4.18), tomato steamed buns(4.18), tomato topped pizzas(4.08), tomato spaghetti(4.02), tomato curry (3.81), and tomato stuffed fried rice(3.81) indicating that the levels of satisfaction with tomato topped baguettes, fried tomatoes, and tomato steamed bun were high. **Improvements/Applications:** The tomato cuisines developed in the present study will enable tomato farms to create added values by selling tomatoes that have been sold only as a raw product as cuisines to consumers who visit their farms or by utilizing the cuisines for cooking experience programs and this can be a measure to activate rural convergence industries.

Keywords: Activation of Rural Convergence Industry, Commercialize Regional Cuisine, Food Development, Regional Cuisine, Rural Convergence Industry

1. Introduction

Regional cuisines refer to those cuisines¹ that are spatially limited, are made using the relevant region's specialties affected by natural environments in the region such as soil, climate and have been passed down from old times and eaten until now and they are becoming effective measures to commercialize places based on rationality, activate

regional economy, establish residents' senses of identity with, belonging to the regions and pride, and promote their emotional stability². Regional cuisines refer to those cuisines made using the food materials produced in the relevant region in methods unique to the region and are divided into 1. Pure regional cuisines made by cooking food materials produced only in the relevant region with cooking methods passed down only among the people in

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that region, 2. Those regional cuisines by cooking food materials produced in other regions in specially prepared cooking methods 3. Those regional cuisines that are made in various regions but the cooking methods in individual regions have distinctive characteristics of which the charms are boasted of³.

As experience tours in units of families have been increasing recently due to the diffusion of the five-day workweek and school week and the life style to enjoy leisure culture, the necessity to develop cuisines that can be experiences in units of families since regional cuisines are an essential element for the activation of rural tourism^{4,5}. Commercialization and industrialization of regional cuisines will not only contribute to the growth of the food industry, the promotion of consumption of regional agricultural products, and job creation but also can be utilized as opportunities for the creation of added values such as ripple effects on related industries appear. In addition, regional cuisines are important academic materials that reflect our natural ecological environments and rural culture as well as knowledge resources that can be said to be directly related to modern people's health originating in cuisines.

Rural convergence industries have been defined as those industries that create economic added values through the processing and distribution of tangible/intangible resources in rural areas such as agricultural products and specialties and tourism using the foregoing resources and by providing related goods or services. In⁶ Rural convergence, industries are aimed to activate regional economy utilizing the rich and excellent resources in agricultural/rural areas⁷, and have been introduced as a new change intended to break from the continuing negative situations in rural society such as population decrease, aging, and the widening income gaps between rural areas and urban areas by increasing added values in agriculture and farm incomes and creating new jobs⁸.

Tomato is an annual crop in the solanaceae family mainly cultivated in the temperate regions that is a global health-food to the extent that it was selected as one of 10 major health-foods in 2002 by the Times, a weekly news magazine in the USA and is a fruit vegetable of which the outputs have been increasing every year in various countries in the world. In⁹ Major forms of consumption of tomatoes are eating as a raw food and eating as a juice although the ratio of eating them made into cuisines or salad has been increasing little by little¹⁰. Tomatoes contain diverse bioactive substances including abundant lycopene that shows excellent antioxidant activity and

anticancer effect and in particular, they are known to have various biological activities and efficacy such as the prevention of stomach cancer, lung cancer, and prostate cancer, the promotion of brain cell functions, appetite, and skin metabolism, hypertensive effects, improving blood circulation and fatigue recovery effects^{11,12}.

A service task report for the Ministry of Agriculture and Forestry stated the selection criteria for medical herbs that can be industrialized as follows; 1. Should have no problem in legal validity (should be 'raw materials that can be used in foods' as defined by the Korea Food & Drug Administration.), 2. Should have no problem in raw material supply, 3. Items should be selected by allocating utilizable industrial elements, 4. Market scales and economic efficiency should be considered, 5. Items to be industrialized should be analyzed based on the possibility to secure intellectual property rights¹³. Diverse studies have been conducted in relation to the development of cuisines utilizing regional specialties such as a study for the development of menus utilizing specialties in Gyeongbuk region¹, a study for the development of regional menus utilizing lotus roots¹⁴, a study for the development of cuisines using buckwheat and green tea¹⁵, a study for the development of cuisines using codonopsis lanceolata¹⁶, a study on the development of regional cuisines¹⁷, and a study for the development of Chungnam regional cuisines through storytelling¹⁸ and studies related to the activation of rural convergence industries have been actively conducted such as a study for the development of content for convergence industrialization of regional resources¹⁹, measures to activate the sextic industry based on agriculture²⁰, and a study on the strategic tasks for the competitiveness of the sextic industry.²¹ Now when the added value of agriculture as a new growth engine industry is increasing, along with increases in policy attention, the development of inventive regional cuisines has been coming to the fore as a very important resource for the activation of regions to increase tourists and incomes through the development of cuisines utilizing regional specialties¹⁸. Therefore, the present study is intended to seek for measures to activate rural convergence industries by proposing the development of cuisines utilizing tomatoes that have excellent characteristics.

2. Materials and Methods

The tomatoes (*Lycopersicon esculentum*) used in the present study were cultivated in Cheongnam-myeon, Cheongyang-gun, Chungcheongnam-do, which is a

major plantation where revenues exceeding 9 billion won are created every year. To set the direction of development of cuisines added with tomatoes, as shown in Table 1, factors such as food materials, manpower resources, physical resources and products for sales were considered. Self-produced food materials and other food materials that can be easily obtained from surrounding farms should be used, menus that do not require much manual work mainly consisting of one-dish meals should be developed for manpower efficiency, and menus that enable experience should be developed considering surrounding conditions such as kitchen environments.

Table 1. Direction of development of regional cuisines

| Element | |
|-------------------|--|
| Food materials | *self-produced food materials *in-season food materials by season *food materials that can be easily obtained from surrounding farms |
| Manpower resource | *menus that do not require much manual work *mainly one-dish meals development |
| Physical resource | *consider surrounding conditions *consider spatial accessibility *consider kitchen environments |
| Products for sale | *menus utilizing tomatoes *develop those cuisines that enable experience |

As planning components for menu development, as shown in Table 2, the value pursued, cooking methods, utilizable menus, menu prices, customer types, costs and profitability and service types are considered. The direction of development of cuisines utilizing tomatoes was set as follows; 1. Pursue values such as health, in-season cuisines, diet, and regional agricultural products, 2. Utilize cooking methods such as baking, steaming, low-salt, raw food eating and vegetarian diet to mainly develop one-dish meals and snacks, 3. The prices should be 5,000~10,000 won and 4. The menus should comprise eating-out type dishes and one-dish meals.

The standard recipes for the seven menus selected as cuisines using tomatoes in the present study show the weights of food materials determined based on one serving. The weights of food materials shown in the recipes are edible portion weights. The menus were selected after cooking menus collected through investigations, examining the cooking method, and conducting sen-

sory evaluation thereby checking whether the tastes and flavor would suit consumers' tastes and preference and the standard recipes for the selected menus were determined through at least three repetitive experiments. Seven tomato cuisines were made using the standard recipes developed in the present study and the 30 panels that participated in the sensory evaluation were selected from among students, regional residents, and experts. In the sensory evaluation, preference was evaluated using a 5-point scale (point 1; I dislike very much, point 5; I like very much). The attributes evaluated in the sensory evaluation were taste, sugar content, concentration, flavor, texture, tomato scent, and overall acceptability. In the sensory evaluation, the cuisines divided into 10g per dish were provided, communication among panels was prohibited to ensure objective evaluation and a sufficient time to evaluate the sample was given.

Table 2. Planning components for regional cuisinemenus

| Element | | Direction of development |
|-------------------------|-----------------------|--|
| Values pursued | | Health, in-season cuisines, diet, regional agricultural products |
| Cooking methods | | Baking, steaming, low-salt, raw food eating, vegetarian diet |
| Utilizable menus | | one-dish meal, snacks |
| Menu prices | | 5,000~10,000 won |
| Customer type | Sex | Unisex |
| | Form of participation | Students, families |
| | Purpose | Cuisines, experience |
| | Age | Children, youths, middle-aged persons |
| Costs and profitability | | 40~50% in principle |
| Service type | | One-dish experience menu, eating-out type, eating-out type + experience type |

Statistical analyses were conducted using the Statistical Package for the Social Science (SPSS), Ver. 12.0, SPSS Inc., and Chicago, IL, USA. The mean and standard deviation of each measurement group were obtained and Analysis of Variance (ANOVAs) were conducted to see whether there were differences among the measurement groups.

3. Results

Cuisines made using tomatoes were searched for through literature research and data collection and the primary menu list items were selected from among the cuisines found through the search considering the direction of menu development, concepts and planning components. Thereafter, to verify the possibility to commercialize the cuisines, the feasibility of the cuisines was reviewed while undergoing discussion with experts two times.

As shown in Table 3, the selected study subject menus were tomato spaghetti, tomato topped pizzas, tomato steamed buns, tomato curry, tomato stuffed fried rice, and tomato topped baguette, and fried tomatoes. The tomato spaghetti were made to have deeper tastes by adding meat to tomato sauces, the tomato topped pizzas were made to have improved tastes and color senses by spreading tomato paste on the dough and topping tomatoes on it, the tomato steamed buns were made to have better tastes and nutrition by stuffing the buns with red bean paste and were added with color senses and nutrition by adding tomato puree to steamed bun dough, and the tomato curry was made to have improved nutrition and texture by adding tomato puree and fresh tomatoes to the sauce. The tomato stuffed fried rice was made to have better taste by removing the inner content of tomatoes, filling the tomatoes with fried rice, and putting cheese on the tomatoes, and the tomato topped baguettes were made to have crispness and freshness by spreading the sauce on the baguette, topping tomatoes on it, sprinkling cheese on it and baking baguette in an oven. Fried tomatoes were made by cutting tomatoes into thin slices, dipping the slices in batter, and frying the slices and tartar sauce containing tomato powder was added.

Table 3. The food list using Tomato

| Food name | Development concept |
|----------------------|---|
| Tomato spaghetti | Spaghetti added with tomato sauce to which deep tastes were added by including meat in the sauce |
| Tomato topping pizza | The taste and the color sense were improved by spreading tomato paste sauce and topping cherry tomatoes |

| | |
|---------------------------|---|
| Tomato steamed bun | Color sense and tastes were improved by inputting red bean paste and adding tomato puree to the steamed bun dough |
| Tomato curry | Nutrition was increased with a curry added with tomato and tomato was added at the end to improve the texture of the food |
| Tomato stuffed fried rice | Tomatoes were hollowed out and filled with fried rice and cheese was topped to improve the taste |
| Tomato topped baguette | Tomatoes were sliced and fried and tartar sauce containing tomato powder was added |
| Tomato fried dish | Tomatoes were topped on baguettes and cheese was scattered on the baguettes and the baguettes were baked in an oven to improve the crispy feeding and freshness |

The recipes of the menus selected as cuisines using tomatoes were standardized on the basis of one serving and the nutritional contents of one serving analyzed by an authorized institution as shown in Table 4 were presented. Fried tomatoes were shown to have the highest calorie with 835.5kcal for 224g and the tomato topped pizza showed the highest protein content with 33.6g of proteins in 286g of the pizza. The tomato topped baguette showed the highest fat content with 70.6g of fat in 220g of the baguette and the tomato spaghetti showed the highest value of vitamin A with 484.3R.E in 408g.

The standard recipes of the cuisines using tomatoes are as shown in Table 5. The tomato spaghetti was made by mincing all ingredients, stir frying all ingredients in a pan, adding an appropriate amount of water or meat broth to the fried ingredients to make the sauce, boiling the sauce until it became thick, and pouring it on the boiled noodle to complete the cuisine. When the completed cuisine was tasted, the beef taste was felt stronger than tomatoes. Therefore, the amount of beef added was reduced to a half to enhance the taste of tomatoes. The tomato topped pizza was made by making pizza dough, spreading the sauce on the dough, and baking it. When the completed pizza was tasted, the beef taste was felt strongly from the sauce.

Table 4. Nutrition analysis of food using Tomato

| Food name | One serving (g) | Nutritional Contents | | | | | | | | | | |
|---------------------------|-----------------|----------------------|-------------------|-------------|---------|--------------|-------------------------|------------------------|------------|---------|---------|---------|
| | | Calorie (Kcal) | Carboh-ydrate (g) | Protein (g) | Fat (g) | Vit A (R.E.) | Vit B ₁ (mg) | VitB ₂ (mg) | Vit C (mg) | Ca (mg) | Fe (mg) | Na (mg) |
| Tomato spaghetti | 408 | 393.0 | 47.3 | 18.5 | 15.3 | 484.3 | 0.40 | 0.28 | 68.92 | 118.83 | 5.55 | 1395.44 |
| Tomato topping pizza | 286 | 640.0 | 71.5 | 33.6 | 29.1 | 435.0 | 0.27 | 0.38 | 62.27 | 558.55 | 2.37 | 859.47 |
| Tomato steamed bun | 225 | 400.5 | 67.8 | 9.3 | 12.5 | 133.8 | 0.13 | 0.06 | 10.00 | 121.96 | 1.54 | 6014.61 |
| Tomato curry | 260 | 649.8 | 77.0 | 19.9 | 29.4 | 252.9 | 0.23 | 0.26 | 10.40 | 99.35 | 7.58 | 5113.13 |
| Tomato stuffed fried rice | 315 | 535.4 | 33.1 | 26.2 | 31.9 | 431.3 | 0.13 | 0.37 | 10.30 | 549.75 | 1057.59 | 979.90 |
| Tomato topping baguette | 220 | 807.3 | 37.3 | 10.2 | 70.6 | 55.4 | 0.11 | 0.10 | 2.87 | 36.10 | 1.19 | 1328.00 |
| Tomato fried dish | 224 | 835.5 | 85.5 | 21.6 | 47.3 | 156.8 | 0.23 | 0.16 | 5.56 | 182.08 | 2.02 | 1602.29 |

Table 5. The recipe of food using Tomato

| Food name | Ingredients & Amount(g) | Recipe |
|----------------------|--|--|
| Tomato spaghetti | Spaghetti 220, Tomato 400, Beef 200, Onion 400, Tomato paste 300, Carrot 40, Garlic 20, Salt 10, Olive oil 30, Parsley 4, Pepper 6 | <ol style="list-style-type: none"> 1. Mince all ingredients. 2. Stir all ingredients and put tomato paste. 3. Boil the ingredients. 4. Pour the sauce on the boiled noodles to complete. |
| Tomato topping pizza | Flour 290, Tomato 40, Tomato paste 200, Mozzarella cheese 400, Garlic 10, Flour 290, Sugar 10, Salt 4, Sausage 100, Olive 30, Pimento 60 | <ol style="list-style-type: none"> 1. Make pizza dough. 2. Make the dough into an approximately 25cm diameter round shape and spread tomato paste on the dough. 3. Top the ingredients on the dough 4. Bake the ingredients in an oven to complete |
| Tomato steamed bun | Flour 2000, Tomato puree 800, Tomato powder 20, Butter 200, Sugar 240, Salt 240, Baking powder 20, Bean paste 50 | <ol style="list-style-type: none"> 1. Make steamed bun dough. 2. Make red bean paste. 3. Put the red bean paste into the steamed bun dough to make the buns. 4. Complete by steaming the bun in a steamer |
| Tomato curry | Curry powder 1000, Tomato 120, Potato 100, Carrot 100, Beef 200, Onion 100, Olive oil 60, Pumpkin 400 | <ol style="list-style-type: none"> 1. Cut and saute the ingredients. 2. Pour water and boil. 3. Add the curry and boil the ingredients. |

| | | |
|----------------------------|--|---|
| 'Tomato stuffed fried rice | Tomato 120, Rice 300, Tomato sauce 140, Egg 40, Carrot 40, Salt 4, Beef 40, Onion 40, Olive oil 30, Mozzarella Cheese 400, Pumpkin 100, pepper 4 | 1. Cut tomatoes to prepare. 2. Make fried rice. 3. Put fried rice into the cut tomatoes. 4. Scatter cheese on the ingredients and bake the item. |
| Tomato topped baguette | Tomato 180, Garlic baguette 600, Sugar 6, Salt 6, Mozzarella cheese 100, Parsley 2 | 1. Cut tomatoes to prepare 2. Top the tomato on the baguettes and bake them. |
| Fried tomatoes | Tomato 180, Mayonnaise 90, Egg 120, Lemon Juice 10, Bread 120, Flour 60, Salt 10, Onion 60, Pickle 30, Salad oil 200 | 1. Cut tomato. 2. Coat the tomato with flour and fry. 3. Make tomato tartar sauce. |

Therefore, the beef was replaced by sausages to enhance the taste of tomatoes. The tomato steamed buns were made using tomato puree, tomato powder, and flour as main materials. After making steamed bun, dough was added with tomato puree, steamed buns stuffed with red bean paste were formed and steamed in a steamer. When the steamed buns were completed, the tomato color was too light. Therefore tomato powder was added to the steamed bun dough to supplement the color sense. The tomato curry was made by cutting and sautéing all ingredients, pouring water and adding curry to the ingredients, and boiling them until they became thick and tomatoes were added last before completing the cuisine to maintain the texture of tomatoes. The tomato stuffed fried rice was made by hollowing tomatoes, stuffing the tomatoes with fried rice, sprinkling cheese on the tomatoes and baking the tomatoes. Deep tastes were made by including beef in the ingredients of the fried rice. The tomato topped baguette was made by putting sliced tomatoes on the baguette, sprinkling cheese on it, and baking it until it became yellowish and was completed after removing moisture because the bread tends to become damp due to the moisture in the tomatoes. The fried tomatoes were made by cutting tomatoes into 1cm thick rings, dipping the tomato rings in batter, and frying them. The moisture in the tomatoes was removed before cooking and tartar sauce containing tomato power was added to improve the texture and nutrition.

The general characteristics of the participants in the sensory evaluation of the cuisines using tomatoes developed in the present study are as shown in Table 6. The total number of participants was 30 consisting of 12 males and 18 females and of the participants, those in their 40's showed the largest percentage with 53%(n=16) followed

by those in their 20's with 27%(n=8), and those in their 30's with 13%(n=4).

The survey subjects 'tomatoes product intake patterns are as shown in Table 7. The 'Tomato utilizing cuisine intake frequencies' were advised to be approximately once per week by 47 %(n=14) of the survey subjects, 2~3 times per week by 40% (n=12), and 4~5 times per week by 13% (n=4) indicating that most of them were eating tomato cuisines at least once per week. The 'type of tomato products eaten frequently' was advised to be tomato spaghetti by 47 %(n=14) of the survey subjects, tomato salad by 33%(n=10) and tomato pizza by 13%(n=4) indicating that tomatoes spaghetti was eaten the most frequently.

Table 6. General characteristics

| Variables | | N(%) |
|-----------|---------|----------|
| Gender | Male | 12(40.0) |
| | Female | 18(60.0) |
| Age | ≤20 | 2(6.7) |
| | 21 ~ 30 | 8(26.7) |
| | 31 ~ 40 | 4(13.3) |
| | 40≤ | 16(53.3) |

The results of sensory evaluation of the seven cuisines using tomatoes developed in the present study are as shown in Table 8. In the results of the sensory evaluation of the tomato cuisines, among those cuisines that showed positive opinions with scores not lower than 4 points, tomato topped baguette showed the highest score of M=4.43 followed by fried tomatoes (4.18), tomato steamed bun (4.18), tomato topped pizza (4.08), tomatoes spaghetti (4.02) and tomato curry. Tomato stuffed

fried rice showed satisfactory scores lower than 4 points, which was 3.81 points. Tomato baguette showed the highest satisfaction scores among the tomatoes cuisines with taste 4.53, sugar content 4.47, concentration 4.33, texture 4.47, and overall taste 4.47 although tomato steamed buns showed the highest score 4.40 for 'flavor' and fried tomatoes showed the highest score 4.47 for 'tomatoes scent' indicating that overall satisfaction with tomato baguettes, fried tomatoes, and tomato steamed buns was high.

Table 7. Tomato producing take pattern

| Variables | | N(%) |
|---------------------------------|----------------------|----------|
| Tomato product Intake frequency | Eat almost every day | 0(0.0) |
| | 4~5 times per week | 4(13.3) |
| | 2~3times per week | 12(40.0) |
| | Once per week | 14(46.7) |
| | Hardly eat | 0(0.0) |
| Tomato product intake pattern | Tomatopizza | 4(13.3) |
| | Tomatospaghetti | 14(46.7) |
| | Tomatocookie | 0(0.0) |
| | Tomato salad | 10(33.3) |
| | Other | 2(6.7) |

N=30, Mean±SD

Tomato spaghetti showed an overall average satisfaction score of 4.02 and the highest satisfaction score of 4.07 for taste and sugar content and the difference was statistically significant ($F=5.983$, $p<.001$). Tomato topped pizza showed an overall average satisfaction score of 4.08 and the highest satisfaction score of 4.20 for sugar content and the difference was statistically significant ($F=3.702$, $p<.01$). Tomato steamed buns showed an overall average satisfaction score of 4.18 and the highest satisfaction score of 4.40 for flavor and the difference was statistically significant ($F=4.034$, $p<.01$). Tomato curry showed an overall average satisfaction score of 3.83 and the highest satisfaction score of 4.00 for texture but the difference was not statistically significant. Tomato fried rice showed an overall average satisfactory score of 3.83 and the highest satisfactory score of 4.40 for texture and the difference was statistically significant ($F=3.286$, $p<.01$). Tomato baguette showed an overall average satisfaction score of 4.43 and the highest satisfaction score of 4.53 for taste and the difference was statistically significant ($F=2.710$, $p<.05$). Fried tomatoes showed an overall average satisfaction score of 4.18 and the highest satisfaction score of 4.47 for tomatoes scent but the difference was not statistically significant.

Table 8. Preference of food using tomato

| Food name | Taste | Sugar Taste | Concentration | Flavor | Texture | Tomato taste | Overall acceptability | Total | F (p) |
|---------------------------|-------------------------|-------------|---------------|-----------|-----------|--------------|-----------------------|-----------|----------------------------|
| Tomato spaghetti | 4.07±1.08 ¹⁾ | 4.07±0.87 | 3.93±0.78 | 3.80±1.06 | 3.93±0.94 | 3.93±0.78 | 4.00±0.74 | 4.02±0.81 | 5983 (000 ^{***}) |
| Tomato topping pizza | 4.07±0.94 | 4.20±0.55 | 4.13±0.63 | 4.13±0.82 | 4.13±0.97 | 3.73±1.26 | 4.13±0.63 | 4.08±0.79 | 3702 (0002 ^{**}) |
| Tomato steamed bun | 4.00±0.74 | 4.13±0.73 | 4.27±0.69 | 4.40±0.62 | 4.13±0.90 | 4.07±0.69 | 3.93±0.78 | 4.18±0.68 | 4034 (0001 ^{**}) |
| Tomato curry | 3.67±0.88 | 3.73±0.78 | 3.93±0.78 | 3.87±0.63 | 4.00±0.74 | 3.87±1.11 | 3.60±0.72 | 3.83±0.76 | 1571 (0157) |
| Tomato stuffed fried rice | 3.67±0.88 | 3.73±0.78 | 3.93±0.78 | 3.87±0.63 | 4.00±0.74 | 3.87±1.11 | 3.60±0.72 | 3.83±0.76 | 3286 (0004 ^{**}) |
| Tomato topping baguette | 4.53±0.51 | 4.47±0.63 | 4.33±0.71 | 4.33±0.61 | 4.47±0.51 | 4.33±0.48 | 4.47±0.51 | 4.43±0.52 | 2710 (0015) |
| Fried tomatoes | 3.93±0.69 | 4.27±0.78 | 4.07±0.69 | 4.27±0.78 | 4.07±0.78 | 4.47±0.51 | 3.93±0.58 | 4.18±0.61 | 1403 (0215) |

¹⁾ Mean±SD

* $p<.05$, ** $p<.01$, *** $p<.001$

4. Conclusion

The purpose of the present study is to propose the development of cuisines utilizing regional specialties for the activation of rural convergence industries using tomato as a main material. For the selection of menus, the direction was set as using self-produced food materials and food materials that can be easily obtained from surrounding farms, selecting menus that do not require much manual work, and developing menus that will enable experience considering surrounding conditions such as kitchen environments. For menu development planning, health, in-season cuisines, diet, and regional agricultural products were considered as well as other elements such as the utilization of cooking methods such as baking, steaming, low-salt, eating raw foods and vegetarian diet to mainly make one-dish meals and snacks and eating-out type dishes and one-dish menus priced in a range of 5,000~10,000 won.

The standard recipes for the seven menus selected as cuisines using tomatoes were prepared based on four servings and the weights of food materials were determined based on one serving provided in institutional food service. The menus were selected through sensory evaluation and the standard recipes for the selected menus were finally determined through at least three repetitive experiments. The cuisines using tomatoes selected as such were tomato spaghetti, tomato topped pizza, tomato steamed bun, tomato curry, tomato stuffed fried rice, tomato topped baguette, and fried tomatoes. A questionnaire survey was conducted with the 30 panels and the results indicated that the intake frequencies of cuisines utilizing tomatoes were at least once per week in most cases and that frequently eaten forms of tomato products were tomato spaghetti, tomato salad, and tomato pizza.

In the sensory evaluation of the cuisines using tomatoes developed in the present study, the panels generally showed high levels of satisfaction with all the cuisines and the satisfaction with fried tomatoes was shown to be the highest followed by tomato steamed bun, tomato topped baguette, tomato topped pizza, tomato spaghetti, tomato stuffed fried rice in order of precedence. The tomato cuisines developed in the present study may be sold to tourists for experience visiting the farms to obtain revenues and since all the cuisines are utilizable for experience programs, added values can be created by utilizing tomatoes that have been sold only as the natural prod-

uct in cuisines and cooking experience programs. These measures are expected to activate rural convergence industries.

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6. References

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