

Preferences and Consumption Patterns of Consumer to Develop Processed Pork Products for Export

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Abstract

This study was conducted to survey the perception of domestic consumers about traditional pork dishes, and to utilize the survey result as a basis for the development of processed pork products. A survey was conducted on 218 domestic consumers regarding the following: general questions, propensity and preference to consume pork dishes, pork dishes feasible for export, and the types and problems of processed products feasible for export. The results of the survey showed that the respondents consumed pork dishes 3-4 times a month on average and they appeared to consume the pork dishes most frequently in specialized restaurants. The highest preference was shown in *Samgyeopasal gui* (grilled pork belly) and *Galbi gui* (grilled pork rib) among the pork dishes, whereas the lowest preference was shown in *Kkubdegi gui* (grilled pork skin) and *Gookbob* (boiled rice and pork served in soup). When the type of processed pork products available according to pork dishes were analyzed, the result showed that *Samgyeopasal gui* (grilled pork belly) and *Nirbiani* (slices of roast, seasoned pork in width) could be developed as a frozen product, *Geyook Bokeum* (stir-fried spicy pork), *Bulgogi* (Korean-style barbecued pork), and *Galbi jjim* (braised short ribs) could be developed as a retort product, and that *Bossam* (boiled pork eaten with a salty sauce and wrapped in greens), *Pyeonyuk* (slices of boiled pork), *Jokbal* (pork trotters), and *Sundae* (kneading together seasoned mixture of vegetables and glass noodles stuffing it into casings made of hog intestines, which are then tied off at the ends and boiled) could be developed as a vacuum-packed product. When the survey concerning the problems expected in the development of processed products using pork dishes was conducted, the result showed that there could be a texture change issue for *Galbi gui*, *Samgyeopasal gui* and *Nirbiani*; a preservation issue for *Bossam*, *Pyeonyuk*; a safety issue for *Bulgogi* and *Geyook Bokeum*; a taste and flavor change issue for *Geyook Bokeum* and *Sundae*; and a packaging issue for *Gookbob*.

Key words: pork dishes, preference, consumption patterns, processed pork product

Introduction

Import liberalization was executed due to FTA between Korea and Chile in 2004, and FTA between Korea and USA was concluded in 2007. In addition, simultaneous FTA negotiations and pre-meetings for FTA negotiations with advanced countries for livestock industry are currently in progress. Accordingly, not only domestic livestock industry but also distribution and processing industries are expected to be damaged from increased import. In addition, domestic consumers are also concerned about the safety and hygienic condition of foreign livestock. For the past several years, Korean government has invested a lot of funds and established policies on the improvement of production and distribution channel for reinforcing

the competitiveness of domestic livestock industry to measure import liberalization. However, the policies have mainly focused on primary industries, which resulted in relatively less focusing on the investment in livestock processing industry (Lim, 2009).

According to the present condition of exportation and importation of processed meat products published by the Korea meat industries association, the import amount in 2008 was 12,997 ton, increasing by 24.5%, and the export amount was 144.5 ton, increasing by 10.6% compared to the previous year. However, since the outbreak of foot-and-mouth disease in 2000, the stagnant consumption of processed pork products has been continued due to the following reasons such as the accumulation of non-preferred meat parts due to the halt of pork export to Japan, unstable demand and supply due to *Samgyeopasal* based food culture, negative perception of consumers regarding processed meat products containing sodium nitrite, and the restriction of consumption expansion due to different

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policies from those of developed countries (Lim, 2009).

Accordingly, this study was conducted to investigate the perception, preference and consumption pattern of domestic consumers about pork dishes (*Bossam* : boiled pork eaten with a salty sauce and wrapped in greens, *Pyeonyuk* : slices of boiled pork, *Jokbal* : pork trotters, *Bulgogi* : Korean-style barbecued pork, *Galbi jjim* : braised short ribs, *Galbi gui* : grilled pork rib, *Samgyeopasal gui* : grilled pork belly, *Nirbiani* : slices of roast, seasoned pork in width, *Kkubdegi gui* : grilled pork skin, *Gobchang gui* : grilled small intestine, *Gookbob* : boiled rice and pork served in soup, *Sundae* : kneading together seasoned mixture of vegetables and glass noodles stuffing it into casings made of pig intestines, which are then tied off at the ends and boiled, *Geyook Bokeum* : stir-fried spicy pork) and to utilize the survey result as a basis for the development of processed pork products for export using pork consumed the most in the world.

Methods

Survey subjects and duration

The questionnaire consisted of questions designed for this study by referring to previous references. A preliminary survey was conducted on researchers working in the institute and a primary study was conducted after modifying and supplementing the preliminary survey. The survey was conducted on 218 residents in *Kyunggi* province from April 2010 to June 2010.

Survey methods and contents

A total of 227 questionnaires were distributed, of which 218 questionnaires was returned (return rate 96.0%). After surveyors explained survey backgrounds to respondents, the respondents completed the questionnaire in a self-reporting manner. The questionnaire consisted of questions asking general information, the preference and propensity of consumers, export feasibility, the types and problems of products feasible for export. The preference for pork dishes and the feasibility for export were assessed using a 5-point scale. The types and problems of products feasible for export were surveyed by answering to the question (multiple answering). The preference was assessed as follows: 1: very dislike, 3: so so, and 5: very like. The export feasibility was assessed as follows: 1: very low, 3: so so, and 5: very high.

Data analysis

Descriptive analysis, ANOVA, independent samples t-

test, and correspondence analysis were conducted on data collected using SPSS 12.0. The results were denoted as the mean±SD, and Duncan's multiple range test was conducted for Post-Hoc test.

Results and Discussion

General information on the subjects

The respondents, who participated in the survey, consisted of 79 men (36.2%) and 139 women (63.8%). 88 respondents (40.4%) belonged to age of 40-49 years and 65 respondents (29.8%) belonged to age of 29 years or less in order. 136 respondents (62.4%) were in married status and 80 respondents (36.7%) were in unmarried status. 69 respondents (31.7%) were housewives, 65 respondents (29.8%) were office workers, and 56 respondents (25.7%) were professionals in order (Table 1).

Consumption propensity of the subjects regarding pork dishes

The result of the survey on the consumption propensity of the subjects regarding pork dishes was presented in Table 2. For consumption frequency, 87 respondents (39.9%) responded that they consumed pork dishes 3-4 times per month on average. For consuming place, the subjects responded in the following order : specialized restaurant (37.1%) > home (35.7%) > general restaurant (21.4%). The average expense of less than 10,000 won per person accounted for the highest portion of the subjects, and the most preferred cooking method was identi-

Table 1. General characteristics of respondents

Characteristics		Frequency	%
Gender	Male	79	36.2
	Female	139	63.8
Age	< 30	65	29.8
	30-40	55	25.2
	40-50	88	40.4
	≥ 50	10	4.6
Marriage status	Single	80	36.7
	Married	136	62.4
	No response	2	0.9
Occupation	Student	6	2.8
	Office worker	65	29.8
	Housewife	69	31.7
	Self-employed	11	5.0
	School person	3	1.4
	Profession	56	25.7
	Others	5	2.3
No response	3	1.4	

Table 2. Consumption patterns of pork dishes

Characteristics		Frequency	%
Intake frequency (per month)	1-2	40	18.3
	3-4	87	39.9
	5-6	52	23.9
	7-8	22	10.1
	Over 9	14	6.4
	No response	3	1.4
Eating place (multiple answers)	Family restaurant	8	2.3
	General restaurant	75	21.4
	Home	125	35.7
	Specialized restaurant	130	37.1
	School (Office) cafeteria	12	3.4
Actual expense (won/person)	< 10000	145	66.5
	1-20000	57	26.1
	2-30000	13	6.0
	≥ 30000	1	0.5
	No response	2	0.9
Preferred cooking method	Roast	152	69.7
	Stir fry	47	21.6
	Deep fry	1	0.5
	Steam	11	5.0
	Stew	4	1.8
	No response	3	1.4
Important fac- tors to consider (score)	Items	M±SD	Rank
	Taste	6.09±1.18	1
	Health	3.68±1.37	5
	Moderate amount	3.17±1.27	6
	Price	4.03±1.42	4
	Freshness	5.45±1.18	2
	Provenance	4.56±1.82	3
	Others (Aroma, safety)	0.35±0.99	7

fied to be roast (*gui*). This result was similar to that of a study conducted by Kim *et al.* (2010) reporting that the most preferred cooking method was identified to be roast (*gui*) in the cases of meat dishes. Upon the selection of pork dishes, factors were considered to be important in the following order : taste > freshness > provenance (place of origin) > price > health > amount. This result was also similar to that of the study conducted by Kim *et al.* (2010) reporting that taste was the number one priority upon the selection of meat dishes.

Preference for pork dishes

When preference for pork dishes was surveyed, higher preference was shown in *Samgyeopasal gui* (4.18) and *Galbi gui* (4.13). This result was similar to that of a study conducted by Kwak and Ko (2006) reporting that *Pork galbi* (46.0%) and *Samgyeopasal gui* (40.5%) were the most frequently selected upon going out to eat with fam-

ily, and those of studies conducted by Kim and Kim (2009), and Kim *et al.* (2010). This result is likely to be attributable to the fact that *Samgyeopasal*, *Moksal* (boston butt), and *Galbi* are mainly consumed for roast (*gui*) in the domestic consumption pattern of pork. On the contrary, the preference for *Kkubdegi gui* (2.44) and *Gookbob* (2.60) were shown to be low (Table3). This result was consistent with that of a study conducted by Choi (2009) reporting that the highest preference was shown in *Samgyeopasal gui* and the lowest preference was shown in *gookbob*.

When the preference for pork dishes was surveyed according to gender, a significant difference was found in *Kkubdegi gui* ($p<0.05$), *Gobchang gui* ($p<0.05$), and *Gookbob* ($p<0.001$). However, high preference for *Samgyeopasal gui* and *Galbi gui* was shown regardless of gender.

When the preference for pork dishes was surveyed according to age, below 30 age group had a high preference in *Jokbal*, *Kkubdegi gui*, *Gobchang gui* ($p<0.01$), *Bulgogi*, *Galbi jjim*, and *Nirbiani* ($p<0.05$) compared with other age groups.

Pork dishes feasible for export

When pork dishes feasible for export was surveyed, the feasibility was shown to be high in *Galbi gui* (4.07), *Galbi jjim* (4.06), and *Nirbiani* (4.00). Meanwhile, the feasibility was shown to be low in *Gookbob* (2.19), *Kkubdegi gui* (2.32), *Gobchang gui* (2.35) (Table 4).

When the feasibility for export was surveyed according to gender, the feasibility was shown to be high in *Galbi jjim* (4.00), *Galbi gui* (3.97), and *Bulgogi* (3.85) in order for men and in *Nirbiani* (4.13), *Galbi jjim* (4.13), and *Galbi gui* (4.09) in order for women. A significant difference was found in *Nirbiani* ($p<0.01$) and *Kkubdegi gui* ($p<0.05$) between men and women.

When the feasibility for export was surveyed according to age, a significant difference was found in *Bulgogi*, *Nirbiani*, and *Geyook bokeum* ($p<0.01$). For age less than 30 years, the highest feasibility was shown in *Nirbiani* (4.37). For age of 30-40, 40-50 years, the highest feasibility was shown in *Galbi gui* (4.20 and 4.00, respectively). For age of 50 years or higher, the highest feasibility was shown in *Galbi jjim* (4.30).

Types and problems of the processed pork dishes feasible for export

The result of analyzing the types of the processed pork dishes feasible for export was presented in Fig. 1. Correspondence analysis shows correlation between factors on

Table 3. Consumer's preference of pork dishes

(M±SD)

Items ¹⁾	<i>Bossam, Pyeonyuk</i>	<i>Jokbal</i>	<i>Bulgogi</i>	<i>Galbi jjim</i>	<i>Galbigui</i>	<i>Samgyeop-sal gui</i>	<i>Nirbiani</i>	<i>Kkubdegi gui</i>	<i>Gobchang gui</i>	<i>Gookbob</i>	<i>Sundae</i>	<i>Geyook Bokeum</i>
Preference (n)	3.87±0.87 (217)	3.59±0.99 (217)	3.75±0.87 (217)	3.86±0.84 (216)	4.13±0.82 (216)	4.18±0.90 (217)	3.36±1.02 (212)	2.44±1.16 (214)	2.91±1.33 (214)	2.60±1.22 (214)	3.65±0.91 (216)	3.84±0.90 (217)
Gender												
Male (n)	3.96±0.83 (78)	3.72±0.95 (78)	3.77±0.91 (78)	3.87±0.91 (77)	4.04±0.87 (77)	4.23±0.82 (78)	3.28±0.94 (75)	2.69±1.07 (77)	3.22±1.21 (76)	3.01±1.08 (76)	3.57±0.95 (77)	3.88±0.87 (78)
Female (n)	3.82±0.88 (139)	3.51±1.01 (139)	3.73±0.85 (139)	3.85±0.81 (139)	4.19±0.80 (139)	4.15±0.94 (139)	3.41±1.03 (137)	2.31±1.20 (137)	2.74±1.36 (138)	2.38±1.23 (138)	3.70±0.88 (139)	3.81±0.92 (139)
T-value	1.15	1.48	0.29	0.18	-1.27	0.63	-0.88	2.33*	2.59*	3.93***	0.98	0.56
Ages												
<30 (n)	3.97±0.85 (65)	3.82±1.01 (65)	4.00±0.75 (65)	4.09±0.74 (65)	4.31±0.71 (65)	4.22±0.98 ^{ab} (65)	3.69±1.02 ^b (64)	2.78±1.20 (64)	3.38±1.40 ^b (64)	2.88±1.24 (65)	3.80±0.89 (65)	3.86±0.98 (65)
30-40 (n=54)	3.98±0.88	3.80±0.79	3.76±0.87	3.81±0.91	4.11±0.86	4.33±0.78 ^b	3.22±1.11 ^{ab}	2.57±1.16	2.96±1.40 ^{ab}	2.65±1.18	3.80±0.88	3.96±0.87
40-50 (n)	3.72±0.88 (88)	3.31±1.02 (88)	3.53±0.92 (88)	3.71±0.84 (87)	4.02±0.88 (87)	4.10±0.91 ^{ab} (88)	3.26±0.94 ^{ab} (86)	2.14±1.08 (86)	2.57±1.20 ^a (86)	2.41±1.22 (86)	3.48±0.92 (88)	3.78±0.85 (88)
≥50 (n)	4.00±0.67 (10)	3.40±0.84 (10)	3.90±0.74 (10)	3.80±0.79 (10)	4.10±0.74 (10)	3.80±0.79 ^a (10)	2.88±0.64 ^a (8)	2.20±1.14 (10)	2.60±0.84 ^a (10)	2.22±0.83 (9)	3.44±0.88 (9)	3.50±0.97 (10)
F-value	1.596	4.627**	3.852*	2.663*	1.529	1.384	3.562*	4.312**	4.975**	2.198	2.319	0.934

5 scale (1, dislike extremely; 5, like extremely)

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

^{ab}Duncan's multiple range test

¹⁾*Bossam*, boiled pork eaten with a salty sauce and wrapped in greens; *Pyeonyuk*, slices of boiled pork; *Jokbal*, pork trotters; *Bulgogi*, Korean-style barbecued pork; *Galbi jjim*, braised short ribs; *Galbi gui*, grilled pork rib; *Samgyeopasal gui*, grilled pork belly; *Nirbiani*, slices of roast, seasoned pork in width; *Kkubdegi gui*, grilled pork skin; *Gobchang gui*, grilled small intestine; *Gookbob*, boiled rice and pork served in soup; *Sundae*, kneading together seasoned mixture of vegetables and glass noodles stuffing it into casings made of pig intestines which are then tied off at the ends and boiled; *Geyook Bokeum*, stir-fried spicy pork

a 2-dimensional map. The correlation is high if between point's distance is close.

For the types of the processed pork dishes feasible for export, the result showed that *Samgyeopasal gui* and *Nirbiani* could be developed as a frozen product; *Geyook bokeum*, *Bulgogi*, and *Galbi jjim* as a retort product; *Gookbob* could as a can product; and *Bossam*, *Pyeonyuk*, *Sundae*, and *Jokbal* as a vacuum-packed product.

For the problems of the processed pork dishes feasible for export, the result showed that texture change could be problematic in *Galbi gui*, *Samgyeopasal gui*, and *Nirbiani*; preservation could be problematic in *Bossam* and *Pyeonyuk*; safety (food additives) could be problematic in *Bulgogi* and *Geyook bokeum*; changes in taste and flavor could be problematic in *Galbi jjim* and *Sundae*; and packing could be problematic in *Gookbob* (Fig. 2). The afore-

mentioned results were similar to those of a study conducted by Yoon (2003) reporting that reasons of not trusting processed meat products were shown to be containing of additives and hazardous chemicals (44.1%), amount and quality (28.7%), and preservation condition (15.2%) in order. Thus, the aforementioned results showed that hygiene and health such as additives and hazardous chemicals were major concerns.

Conclusion

This study was conducted to survey the perception of domestic consumers about traditional pork dishes, and to utilize the survey result as a basis for the development of processed pork products using traditional pork dishes. Among the pork dishes, higher preference was shown in

Table 4. Feasibility score of processed pork products for export

(M± SD)

Items ¹⁾	<i>Bossam, Pyeonyuk</i>	<i>Jokbal</i>	<i>Bulgogi</i>	<i>Galbi jjim</i>	<i>Galbigui</i>	<i>Samgyeopsal gui</i>	<i>Nirbiani</i>	<i>Kkubdegi gui</i>	<i>Gobchang gui</i>	<i>Gookbob</i>	<i>Sundae</i>	<i>Geyook Bokeum</i>
Feasibility ²⁾ (n)	3.67±0.89 (217)	3.67±1.00 (216)	3.95±0.90 (215)	4.06±0.89 (216)	4.07±0.94 (214)	3.42±1.13 (216)	4.00±0.99 (216)	2.32±1.01 (213)	2.35±0.96 (212)	2.19±0.93 (213)	3.29±1.12 (215)	3.61±0.86 (217)
Gender												
Male (n)	3.66±1.04 (79)	3.72±1.00 (79)	3.85±0.96 (78)	4.00±0.95 (78)	3.97±0.99 (78)	3.49±1.12 (79)	3.76±1.08 (78)	2.51±1.11 (77)	2.48±0.97 (77)	2.31±1.03 (77)	3.24±3.32 (78)	3.62±0.95 (79)
Female (n)	3.64±0.85 (138)	3.58±1.09 (137)	4.01±0.87 (138)	4.09±0.85 (138)	4.13±0.90 (136)	3.37±1.14 (137)	4.13±0.90 (138)	2.21±0.95 (136)	2.28±0.96 (135)	2.13±0.86 (136)	3.32±1.10 (137)	3.61±0.81 (138)
t-value	-0.12	0.61	-1.32	-0.75	-1.19	0.76	-2.72**	2.04*	1.45	1.41	-0.49	0.10
Ages												
< 30 (n)	3.66±0.91 (65)	3.62±1.09 (65)	4.30±0.85 ^b (64)	4.23±0.77 (64)	4.08±0.94 (63)	3.45±1.19 (64)	4.37±0.74 ^b (65)	2.14±0.91 (64)	2.28±1.00 (64)	2.19±0.81 (64)	3.15±1.20 (65)	3.89±0.81 ^b (65)
30-40 (n)	3.80±0.83 (55)	3.74±1.05 (54)	3.98±0.90 ^{ab} (54)	4.07±1.03 (55)	4.20±0.90 (54)	3.46±1.08 (54)	3.81±1.15 ^a (54)	2.24±0.78 (54)	2.34±1.00 (53)	2.13±0.91 (54)	3.26±1.07 (54)	3.69±0.84 ^{ab} (54)
40-50 (n)	3.59±0.94 (87)	3.64±0.93 (87)	3.71±0.86 ^a (87)	3.90±0.88 (87)	4.00±0.94 (87)	3.35±1.12 (88)	3.90±0.94 ^{ab} (87)	2.48±1.16 (85)	2.45±0.92 (85)	2.21±0.99 (85)	3.37±1.07 (86)	3.40±0.84 ^a (88)
≥ 50 (n=10)	3.70±0.68	3.80±0.92	3.70±0.95 ^a	4.30±0.68	4.00±1.16	3.50±1.27	3.40±1.17 ^a	2.50±1.35	2.10±1.00	2.40±1.27	3.70±1.34	3.30±0.95 ^a
F-value	0.654	0.227	5.827**	2.075	0.544	0.164	5.558**	1.621	0.616	0.259	0.926	4.958**

¹⁾Refer to Table 3

²⁾5 scale (1, very low; 5, very high)

p* < 0.05 *p* < 0.01

^{ab}Duncan's multiple range test

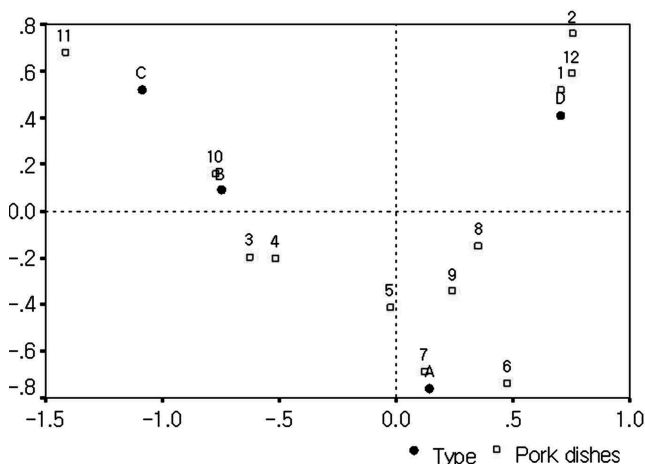


Fig. 1. Correspondence-plot of processing type by pork dishes.
1, *Bossam, Pyeonyuk*; 2, *Jokbal*; 3, *Bulgogi*; 4, *Galbi jjim*; 5, *Galbi gui*; 6, *Samgyeopsal gui*; 7, *Nirbiani*; 8, *Kkubdegi gui*; 9, *Gobchang gui*; 10, *Geyook Bokeum*; 11, *Gookbob*; 12, *Sundae*. A, Frozen product; B, Retort; C, Can; D, Vacuum wrapping

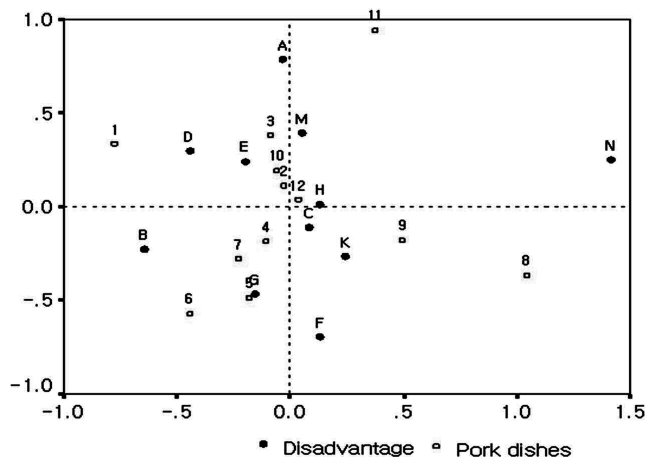


Fig. 2. Correspondence-plot of disadvantage by pork dishes.
1, *Bossam, Pyeonyuk*; 2, *Jokbal*; 3, *Bulgogi*; 4, *Galbi jjim*; 5, *Galbi gui*; 6, *Samgyeopsal gui*; 7, *Nirbiani*; 8, *Kkubdegi gui*; 9, *Gobchang gui*; 10, *Geyook Bokeum*; 11, *Gookbob*; 12, *Sundae*. A, Packaging; B, Price; C, Taste; D, Conservativeness (storability); E, Safety (food additives); F, Cooking convenience; G, Texture changes; H, Aroma changes; K, Size of product; M, Destroying nutrients; N, Type of contents

Samgyeopasal gui and *Galbi gui*. And the feasibility was shown to be high in *Galbi gui*, *Galbi jjim*, and *Nirbiani*. For the problems of the processed pork dishes feasible for export, the result showed that texture change could be problematic in *Galbi gui*, *Samgyeopasal gui*, and *Nirbiani*; preservation (storability) could be problematic in *Bossam* and *Pyeonyuk*; safety (food additives) could be problematic in *Bulgogi* and *Geyook bokeum*; changes in taste and flavor could be problematic in *Galbi jjim* and *Sundae*; and packaging could be problematic in *Gookbob*.

The results of this study, a domestic consumer prefer and think feasible for export *Samgyeopasal gui*, *Galbi gui*, *Galbi jjim*. Also need to future research about hygiene and safety regard to processed pork products. If improve the problems of each pork dishes, it seem to be feasible for export of Korea's traditional pork dishes.

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(Received 2011.5.27/Revised 1st 2011.12.23, 2nd 2011.12.27/
Accepted 2011.12.29)