3. Animal Products research

(1) Research on the differentiate in the quality of domestic pork

This research was carried out to investigate the quality evaluation methods for production of high quality pork belly, and to reflect the best weight for the slaughtering on the pork carcass grading evaluation. A total of 258 pigs (female pigs 128, castrated pigs 130) were slaughtered to investigate the carcass weight and yields in 2009 and 2010. The average live weights were 117 ㎏, hot carcass weights were 89.8 ㎏, cold carcass weights were 88 ㎏ and backfat thickness was 22 ㎜. With the increase of slaughter weight, carcass weight, backfat thickness, skin and bone yields were increased, however, the feet yields were decreased only when the slaughter weight was higher than 130kg. The average carcass weight rates were 76.55% and they increased as the slaughter weight decreased. The retail cut weight was 63.34% as they decreased at the slaughter weight increased whereas body fat increased. In the frequency of distribution and over inside fat (dduk fat) of pork belly, the belly size and thickness were increased as the slaughter weight. The frequency of the inside fat (dduk fat), which is the quality defect, was increased as the slaughter weight increased and it was higher for the castrated pig than female pigs. The quality analysis of pork loin showed that pH at 24 hours values, chemical composition (protein, fat and moisture contents), cooking loss, water holding capacity and Warner-Bratzler shear force were not significantly different among the various slaughtering weights. With the increase of slaughter weight, L values (lightness) and collagen contents were decreased as the values (redness) were increased. The pork belly and loin quality were evaluated depending on the metabolism energy condition in feed. The carcass weight and backfat thickness were not significantly different between the control and treatment group. In the carcass properties, the retail cut weight rates were 66.69 and 66.58%, the fat yields were 13.23 and 12.84%, skin yields were 7.25 and 7.24%, bone yields were 10.24 and 10.71% for the control and treatments, respectively. The belly weights were 2.03 and 12.18㎏, belly length were 51.62 and 53.21㎝ for the control and treatments, respectively. The pH and color (L, a*, b*) values of loin were not significantly

different among the control and treatments (5.59 and 5.58), respectively. In drip loss, the treatments had higher values (1.24%) than the control (0.92%).

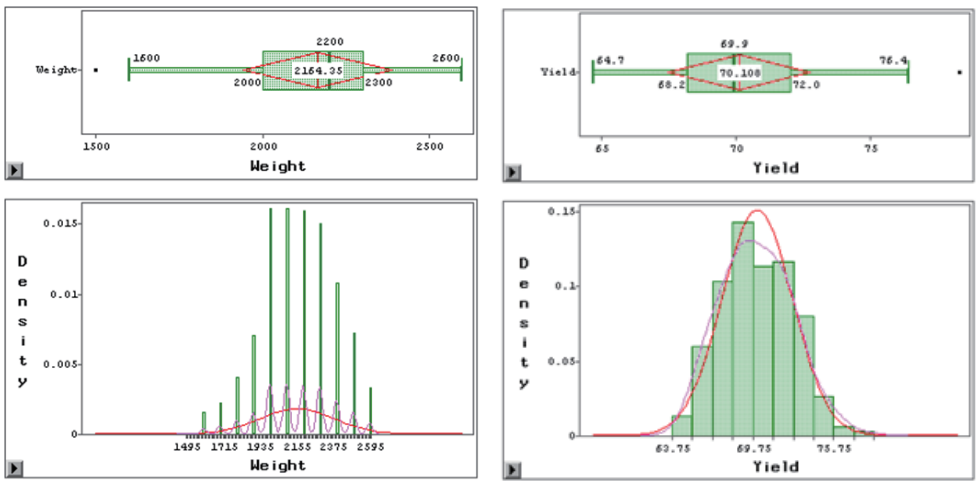
The names of muscle distribution on the belly between 4th and 5th rib

	Body Weight (□)						Total Total
	105	110	115	120	125	130	
length of belly	51.97^{bc} ±0.32	51.67^{c} ±0.49	53.03^{b} ±0.20	52.03^{bc} ±0.56	54.42^{a} ±0.30	54.37^{a} ±0.33	52.82 ±0.17
width of belly -5th rib	33.97^{ab} ±0.31	34.39^{ab} ±0.39	34.86^{a} ±0.38	34.58^{ab} ±0.48	35.2^{a} ±0.30	33.48^{b} ±0.49	34.43 ±0.16
-6th rib	33.68^{ab} ±0.27	34.29^{ab} ±0.51	34.29^{ab} ±0.28	34.07^{ab} ±0.31	34.69^{a} ±0.33	33.35^{b} ±0.34	34.05 ±0.14
-8th rib	39.24 ±6.88	32.57 ±0.43	33.35 ±0.21	33.48 ±0.25	33.24 ±0.24	32.41 ±0.24	34.41 ±1.53
-10th rib	32.15^{b} ±0.23	31.84^{b} ±0.38	32.98^{a} ±0.16	33.09^{a} ±0.26	32.95^{a} ±0.23	32.11^{b} ±0.24	32.54 ±0.10
-12th rib	31.55^{c} ±0.20	31.34^{c} ±0.33	32.64^{ab} ±0.17	32.59^{ab} ±0.26	32.79^{a} ±0.21	32.01^{bc} ±0.20	32.19 ±0.10
-14th rib	31.00^{cd} 0.26	30.58^{d} ±0.28	31.92^{ab} 0.16	31.85^{ab} 0.28	32.47^{a} ±0.25	31.39^{bc} ±0.22	31.59 ±0.11

Size of belly (length & width, cm)

(2) Current state of live and carcass weight distribution from domestic product duck

The objective of this study was to investigate the current state of carcass weight distribution and external quality of domestic duck products. A total of 419,164 duck heads were used for the carcass weight distribution analysis. From the results, the average, mode, median, and quartile were 2,164.4, 2,000, 2,200, and 300 g, respectively. Furthermore, carcass yield averaged 70.1% from the live weights of domestic duck products. Duck carcasses had 28.4% external defects and 4.8% external damage. Moreover, the appearance ratio of discoloration was 34.1% and, in particular, the leg region was significantly ($p<0.05$) higher than that of the other regions. The feather removal defect ratio averaged 44% from the duck carcass surface. The ratio of disjointed and broken bones averaged 9.91 % and mostly appeared in wing and leg parts. Fat content was significantly ($p<0.05$) higher in carcasses with weights 〉 2.3kg than that of other carcass weight levels, suggesting that market live weight of domestic duck products must be greater than a minimum of 3kg.

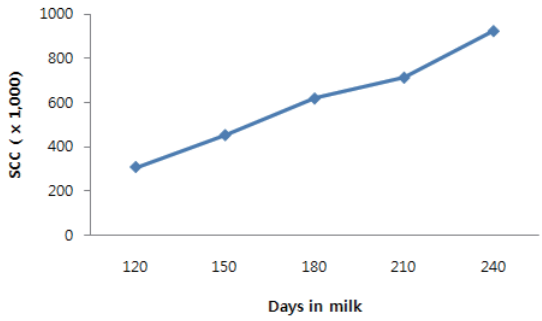


Histogram distributions of live weight (g, left) and carcass yield (%, right) from domestic product duck.

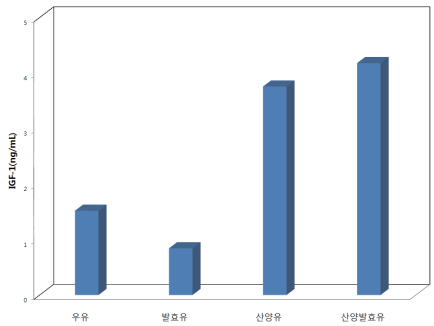
(3) Improvement of goat milk quality and Development of functional fermented goat milk for reducing blood glucose levels

The aim of this study was to enlarge dairy goat industry by improving raw milk quality and developing functional fermented milk product. Analyzing method for goat milk somatic cell counts were not set, and non-infection factors were affected to the high somatic cell counts of goat milk. Somatic cell counts of goat milk were excluded from raw milk quality items by amendment of NVRQA notice. New grading system for goat milk somatic cells would be necessary after activation of goat milk industry.

We reported the dffects of reducing the blood glucose levels in type 2 a diabetes rats by feeding goat yogurt. To investigate the active materials, we compared the IGF-1(Insulin-like growth factor-1) content of goat and cow milk before and after fermentation. It was reported that the people with low blood IGF-1 had higher risks of diabetes. IGF-1 content of goat milk was varied according to month, and higher than that of cow milk. Fermented goat milk showed 5 times higher IGF-1 content than that of fermented cow milk.



Somatic cell counts according to milking period



IGF-1 content of goat and cow milk befere and afere fermentation

(4) Development of milk products using Lactobacillus isolated from Korean traditional food

The aim of this study was to develop a new starter for fermented milk. The approach started with 103 acid-producing isolates from Kimchi, a type of spiced, fermented cabbage and then PCR screening was used to identify 72 Lactobacillus strains. The ability to inhibit the growth of food-borne human pathogens(Escherichia coli, Salmonella enteritidis, Staphylococcus aureus) of these strains were measured, using the paper disk method. Among them, one bacterium(LHB55) that showed a strong antibacterial activity against food-borne human pathogens was identified and further characterized, using 16S rDNA sequencing and API 50CHL system. Because this isolate was identified as L. plantarum, it was named as L. plantarum LHB55. The yogurt produced using commercial LAB with L. plantarum LHB55 did not display properties that are microbially or physico-chemically different from the control group, which suggests that L. plantarum LHB55 can be used as a useful starter for yogurt containing high antibacterial activity. We think that identifying effective starter strains enabling further development of fermented milk that can deliver better health benefits such as antimicrobial properties is of high significance, and thus our effort in this type of approach will continue.

Antimicrobial activity of L. plantarum LHC52

Microorganism	Indicator	Activity
Gram-negative bacteria	*Escherichia coli K-99* *Salmonella enterica A*	+++++ ++++
Gram-positive bacteria	Staphylococcus aureusKCCM 12256	+++

General composition and physicochemical properties of the yogurts

Treatment	Fat	Protein	Lactose	Total Solid	pH
Control	3.41±0.011)	2.72±0.01	4.1±0.02	18.49±0.01	4.81±0.02
LHC52	3.37±0.01	2.79±0.01	3.99±0.02	18.43±0.02	4.69±0.02