

Study on the overview on food borne bacteria in foodstuffs with animal origin in Iran; Part two: meat and meat products

Shekarforoush, S.S.^{1*}, Rokni, N.², Karim, G.², Razavi Rohani, S.M.³, Kiaie, S.M.M.², Abbasvali, M.⁴

1- Professor, School of Veterinary Medicine, Shiraz University.

2- Professor, Faculty of Veterinary Medicine, University of Tehran.

3- Professor, Faculty of Veterinary Medicine, University of Urmia.

4- Assistant Professor, Faculty of Veterinary Medicine, Shahrekord University.

*Corresponding author email: shekar@shekar@shirazu.ac.ir

(Received: 2013/1/29 Accepted: 2013/5/11)

Abstract

The present study was aimed to review the contamination of meat and meat products with pathogenic bacteria in Iran. Little information is available about the contamination of meat and meat products with *Bacillus cereus*, because of the low contamination rate with the microorganism. The situation is about the same with *Brucella*, as the microorganism can hardly be seen in the muscles. However, not too many information is available on the contamination with *Campylobacter jejuni*, even though, the contamination of chicken meat with the campylobacter was addressed. *Clostridium butolinum* was the main discriminated bacterium to contaminate fish and its products and canned meats. Studies revealed that the big portions of meat were less likely contaminated with *E. coli* compared to the minced meat. Our study showed that the cross contamination of sausage is often occurred after the production chain. The situation was possibly attributed to the improvement of hygienic conditions of slaughter-houses and meat industries. Limited information was found on the contamination with *Listeria monocytogenes* and available data indicate that the microorganism can be present in meat and meat products. The most important factor for prevention of contamination is restricted inspection of slaughtered animals before slaughter and omission of diseased animals. Much information was accessible on the cross contamination with *Salmonella* in Iran and elsewhere. *Salmonellosis* is not common in the slaughtered animals despite its epidemiological and public health issues. The problem was also associated with the restricted inspection. Study about the staphylococcal contamination of meat was proportionately numerous. The contamination was mostly occurred in the minced Kebab in the warm seasons of the year. Generally, a low percentage of such contaminations were found in the meat products and sausage, in the surveys.

Key words: Food borne bacteria, Meat, Meat products.

Effect of attenuated *lactobacillus plantarum* as adjunct starter on lipolysis and organoleptic characteristics of UF white cheese

Atazadeh, R.^{1*}, Karim, G.², Hesari, J.³, Hanifian, S.⁴

1- Ph.D Student of Food Hygiene, Faculty of Specialized Veterinary Science, Science and Research Branch, Islamic Azad University, Tehran, Iran.

2- Professor of Food Hygiene Department, Faculty of Veterinary Medicine, University of Tehran, Tehran, Iran.

3- Associate Professor of Food Science and Technology Department, Faculty of Agriculture, Tabriz University, Tabriz, Iran.

4- Assistant Professor of Food Science and Technology Department, Faculty of Agriculture, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

* Corresponding author email: r.atazadeh@gmail.com

(Received: 2013/2/28 Accepted: 2013/4/27)

Abstract

The main objective of this study was to determine the effect of attenuated adjunct culture of *lactobacillus plantarum* on the lipolysis of UF-white cheese as measured by acid degree value, the fatty acids profile, physicochemical, microbial and sensory characteristics during ripening. The results showed that, treated UF cheeses exhibited no significant ($p>0.05$) differences in chemical composition (dry matter, fat, salt and pH) in comparison with the control UF cheeses throughout 60 days of ripening. Total bacterial count and mesophilic *lactobacillus* count in the UF cheeses using attenuated adjunct starter were significantly ($p<0.01$) higher than the control cheeses after 45 days of ripening. The results of fatty acid profiles revealed that due to increasing of the lipolysis in the first 30 days of ripening, the samples containing attenuated adjunct *lactobacillus plantarum* had significantly ($p<0.01$) lower percentages of fatty acids with medium and short chains ($C_{4:0}$ - $C_{14:0}$) in comparison with the control cheeses while the percentage of fatty acids with long chains ($C_{16:0}$ - $C_{18:3}$) increased. Acid degree value, as indicated by total free fatty acids was significantly ($p<0.01$) higher in cheeses using attenuated adjunct *lactobacillus plantarum*. In organoleptic evaluation, UF cheeses received significantly ($p<0.01$) higher total scores than the control samples on day 45. Finally, it could be concluded that cheeses produced by attenuated adjunct *lactobacillus plantarum* have more nutritional quality than the control UF cheeses.

Key words: Attenuated adjunct starter, *Lactobacilli plantarum*, Lipolysis, UF white cheese.

Study of Fe, Zn, Cu, Cd, Pb concentrations in liver, kidney and muscle tissue of cow and sheep marketed in Hamedan in 2011

Sobhanardakani, S.¹, Qasemi, M.², Riahi Khoram, M.¹

1- Assistant Professor of the Environment Department, Hamedan Branch, Islamic Azad University, Hamedan, Iran.

2- Msc Graduated of the Environment, Hamedan Branch, Islamic Azad University, Hamedan, Iran.

* Corresponding author email: ghasemi.maryam47@yahoo.com

(Received: 2013/2/23 Accepted: 2013/6/18)

Abstract

Importance of heavy metals in food safety and detrimental effects of their high concentrations in food stuff is well documented. In this study, concentrations of Fe, Zn, Cu, Cd and Pb in kidney, liver and muscle tissues of cow and sheep at Hamedan retails were evaluated. A total number of 180 samples was assessed for the amount of heavy metals as ppb in wet weight. For this, wet-digestion method was used to determine the concentration of given elements by ICP (Varian ES-710). Results showed that the highest concentration of heavy metals was determined in the liver and kidney samples, while the lowest concentration was found in muscle tissue. Among the heavy metals, Fe in cow's liver had the highest concentration (25507 ± 879 ppb) and Cd in muscle tissue of sheep has the lowest concentration (192 ± 54 ppb). In overall, accumulation of heavy metals in tissues of cows was higher than sheep. Statistical comparison of accumulated metals concentration in various tissues of these two animal groups showed significant difference ($P < 0.001$). Regarding the maximum acceptable concentration approved by EU, the concentration of heavy metals was lower than the allowed level, except for Cd and Pb. Due to the toxicity of Cd, the concentration of Cd was compared with the maximum acceptable limit of WHO. Results revealed that the concentration of Cd was higher than acceptable level in all tissues except for muscle tissues ($P < 0.001$). Mean concentration of most metals in this study was found higher in cow tissues than sheep. It seems that cows are more tolerant against the accumulation of toxic metals. Moreover, mean concentration of Fe and Cu was higher in liver which is justifiable by the fact that liver is a storage organ. Since kidneys are responsible for the removal of wastes, mean concentration of Cd and Pb was determined highest in kidney.

Key words: Heavy metals, Cow, Sheep, Food security, Hamedan.

Contamination of Fresh Beef to *Salmonella typhimurium* and *Salmonella enteritidis* in Sanandaj during 2012

Karimi Darehabi, H.^{1*}, Esmailneshad, F.², Ebrahimi mohammadi, K.³

1- Assistant Professor of Food Hygiene Department, Faculty of Veterinary Science, Sanandaj Branch, Islamic Azad University, Kurdistan, Iran.

2- Member of young Researchers Club, Islamic Azad University, damegan, Iran.

3- Department of food science and technology, Faculty of agriculture, Islamic Azad University, mahabad branch, Iran.

* Corresponding author email: Hiva60iran@yahoo.com

(Received: 2012/8/28 Accepted: 2013/6/25)

Abstract

Salmonella infection is among the main food-borne gastrointestinal disease. Meat has been recognized as a major source of human illness caused by *Salmonella* serovars. The presence of *Salmonella* was detected in 60 samples of fresh beef from retail of Sanandaj. The presence of *Salmonella* was assessed by conventional culture method and confirmed by PCR assay. To confirm the identification of isolated colonies as *Salmonella spp.* and determining serovars as *typhimurium* and *enteritidis* serovars, a multiplex PCR assay, using three pairs of primers were employed. S141 and S139 for *InvA* gene, specific for the genus of *Salmonella*, *Fli15* and *Tym* for *FliC* gene, specific for *typhimurium* serovar and *Prot6e-5* and *Prot6e-6* for *Prot6E* gene, specific for *Enteritidis* serovar. 12 samples 20% were determined as contaminated with *Salmonella spp.* with microbial culture method but with PCR method only seven samples 11.66% were confirmed. 4 samples (6.6%) of isolated colonies were confirmed as *Salmonella Typhimurium* and any number of isolated colonies were confirmed as *Salmonella Enteritidis*, the other isolated colonies were belong to other *Salmonella* serovars. This study showed a relatively high prevalence of *Salmonella* in fresh beef from Sanandaj.

Key words: Beef, *Salmonella typhimurium*, *Salmonella enteritidis*, Multiplex PCR.

A study on the relationship of arsenic accumulation with protein, lipid, ash and moisture contents in muscle of eight species of fish in Iran

Askary Sary, A.¹, Velayatzadeh, M.^{2*}

1- Assistant Professor of Fishery Department, Faculty of Agriculture and Natural Resources, Ahvaz Branch, Islamic Azad University Ahvaz, Iran.

2- Young Researchers Club, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran.

* Corresponding author email: mv.5908@gmail.com

(Received: 2013/2/3 Accepted: 2013/7/18)

Abstract

A comparative study was conducted to investigate a relationship between concentration of arsenic with protein, lipid, ash and moisture content in *Cyprinus carpio*, *Oncorhynchus mykiss*, *Aristichthys nobilis*, *Hypophthalmichthys molitrix*, *Ctenopharyngodon idella*, *Scomberomorus commerson*, *Scomberomorus guttatus* and *Otolithes ruber*. A total of 72 sample of common carp, Bighead carp, silver carp and grass carp fishing from Azadegan fish farming center, Ahvaz; Rainbow trout from Cheshme Dimeh and *Scomberomorus commerson*, *Scomberomorus guttatus* and *Otolithes ruber* caught with gill net from Hendijan. Wet-digestion method was performed prior to arsenic determination in the samples. The level of arsenic was measured by atomic absorption spectrophotometer. The results showed that concentration of arsenic in the muscle of fishes was 269.87 ± 20.96 $\mu\text{g/Kg}$. Moreover, levels of protein, lipid, ash and moisture in the samples were estimated at 19.67 ± 0.78 g/100, 2.45 ± 0.45 g/100, 1.49 ± 0.23 g/100, 78 ± 1.89 g/100, respectively. Results also showed a positive correlation between the accumulation of arsenic in muscle of fishes with levels of protein, lipid, ash and moisture ($p < 0.05$).

Key words: Arsenic, Chemical Compositions, Muscle, Fish, Iran.

Impact of lactic acid bacteria on conjugated linoleic acid content and atherogenic index of butter

Roufegari-Nejad, L.^{1*}, Ehsani, M.R.², Darabi Amin, M.³, Mizani, M.⁴, Alizadeh, A.⁵

1- Ph.D Graduated of Food Science and Technology, Science and Research Branch, Islamic Azad University, Tehran, Iran.

2- Full Professor of Food Science and Technology Department, Science and Research Branch, Islamic Azad University, Tehran, Iran,

3- Assistant Professor of Biochemistry Department, School of Medicine, Tabriz University of Medical Sciences, Tabriz, Iran.

4- Assistant Professor of Food Science and Technology Department, Science and Research Branch, Islamic Azad University, Tehran, Iran.

5- Assistant Professor of Food Science and Technology Department, Tabriz Branch, Islamic Azad University, Tabriz, Iran.

*Corresponding author email: l.roufegari@iaut.ac.ir

(Received: 2012/12/29 Accepted: 2013/6/29)

Abstract

This is a study aimed to investigate the effect of lactic acid bacteria including *Lactobacillus acidophilus* and *Sterptococcus thermophilus* (as thermophilic culture), *Lactococcus lactis* subsp. *lactis*, *cremoris* and *diacetylactis*, *Leuconostoc citrovorum* (as mesophilic culture), *Lactobacillus acidophilus*, *Lactobacillus casei*, *Bifidobacterium lactis* and a mixed culture of *L.acidophilus*, *L. casei* and *B. lactis* on fatty acid profile, conjugated linoleic acid (CLA) and atherogenic index (AI) of butter. Fatty acid analysis with gas chromatography indicated that application of thermophilic and mixed culture decreased the ratio of saturated to unsaturated fatty acid; whereas, the butters made with *L. acidophilus* had the highest content of CLA. Moreover, AI in the samples prepared with thermophilic cultures was the least. Sensory evaluation of the treatments revealed no significant differences ($p > 0/05$) in appearance and color. However, the butters prepared with thermophilic and mesophilic cultures had more desirable taste in comparison with the samples made with *L. acidophilus*, *L. casei* and *B. lactis*. From the nutritional point of view, the adverse effect of butter could be diminished via the application of selected lactic acid bacteria.

Key words: Conjugated linoleic acid, Atherogenic index, Lactic acid bacteria, Butter.

Evaluation of heavy metals concentration in strawberry (Case study: Agricultural lands of Sanandaj)

Cheraghi, M.¹, Ariaeinejad, N.^{2*}, Lorestani, B.³

1- Assistant Professor of Environment Department, Hamedan Branch, Islamic Azad University, Hamedan, Iran.

2- Graduated of Environment, Hamedan Branch, Islamic Azad University, Hamedan, Iran.

3- Assistant Professor of Environment Department, Hamedan Branch, Islamic Azad University, Hamedan, Iran.

*Corresponding author email: ne2008ar@gmail.com

(Received: 2012/8/28 Accepted: 2013/7/17)

Abstract

Contaminants are damaging factors of the ecosystems. Amongst, heavy metals are due to their toxicity, persistence and bio-accumulation are of great concern even in low concentrations. Kurdistan province with an annual production of 30,000 tons of strawberry produces 88 percent of the strawberry in Iran. In this study, 25 samples were obtained randomly from soil (depth of 0-30 cm), leaf and strawberry crop of all five existing farms located on the road of Sanandaj to Kamyaran. The samples were transported to laboratory and acid digestion was performed on the samples. Afterwards, the quantity of cadmium, arsenic, lead, zinc and copper were measured using atomic emission device. The results revealed that metal concentrations of cadmium, zinc and copper (0.01, 6.03, 13.67 mg/kg, respectively) were lower than the standards of FAO/WHO. Meanwhile the concentrations of heavy metals of arsenic and lead (36.88, 3.57 mg/kg, respectively) were higher than the defined standards (with 95% confidence level). It seems that the overuse of chemical fertilizers and pesticides is the main cause of heavy metal contaminations in the strawberry farms.

Key words: Heavy metals, Strawberry, Kurdistan province.

Variations in microbial load of raw milk and influencing factors from dairy farms to collection centers of Esferayen area

Jamshidi, A.^{1*}, Vakili, R.², Seifi, H.³, Hajizadeh, J.⁴

1- Associate Professor of Food Hygiene and Aquatic animal Health Departement, Faculty of Veterinary Medicine, Ferdowsi University, Mashhad, Iran.

2- Assistant Professor of Animal Science Department, Kashmar Branch, Islamic Azad University, Kashmar, Iran.

3- Full Professor of clinical Science Departement, Faculty of Veterinary Medicine, Ferdowsi University, Mashhad, Iran.

4- Graduated of Animal Science, Kashmar Branch, Islamic Azad University, Kashmar, Iran.

*Corresponding author email: ajamshid@um.ac.ir

(Received: 2012/6/17 Accepted: 2013/7/17)

Abstract

Raw milk is among the highly perishable foods which are subjected to various environmental contaminations following milking. In this study, the factors influencing bacterial load of bulk-milk were investigated. For this purpose, 100 samples were obtained from dairy farms around Esferayen during spring, summer and autumn of 2009. The samples were taken in three stages: after milking, before transportation from dairy farm, and before delivering to milk-collection-center. The samples were analyzed for total bacteria count (TBC). To determine the factors which could influence the TBC of raw milk, a questionnaire sheet where designed. Statistical analysis were performed by means of logistic regression (genmod procedure), using SAS software (version 8.2). According to the results of this study, maintaining cold chain throughout the transportation and storage of raw milk, prevention of mastitis, cleaning and sanitizing of containers and equipments, age and breed of dairy cattle as well as indirect factors such as education level of dairy farmers, distance to milk-collection-center had significant effects ($P<0.05$) on microbial count of bulk-tank-milk. It was concluded that to reduce bacterial in raw milk, it is crucial to maintain cold-chain throughout milking process, wash teats with sanitizers, improve the hygienic condition of the milking utensils as well as to improve the overall quality of personnel education.

Key words: Bulk-raw-milk, Total bacterial count, Esferayen.