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Special Report

A Review and Meta-Analysis of Prospective Studies of Red and Processed Meat Intake and Prostate Cancer

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Nutrition Journal, Vol. 9, p. 50, 2010

Link to full text: http://www.nutritionj.com/content/9/1/50

Significance: The results of this meta-analysis are not supportive of an independent positive association between red or processed meat intake and prostate cancer.

A meta-analysis of prospective studies was conducted to estimate potential associations between red or processed meat intake and prostate cancer. Fifteen studies of red meat and 11 studies of processed meat were included in the analyses. No association between high vs. low red meat consumption (SRRE=1.00, 95% CI: 0.96-1.05) or each 100g increment of red meat (SRRE=1.00, 95% CI: 0.95-1.05) and total prostate cancer was observed. No association with red meat was observed for advanced prostate cancer (SRRE=1.01, 95% CI: 0.94-1.09). A weakly elevated summary association between processed meat and total prostate cancer was found (SRRE=1.05, 95% CI: 0.99-1.12), although heterogeneity was present, the association was attenuated in a sub-group analysis of studies that adjusted for multiple potential confounding factors, and publication bias likely affected the summary effect.

Coffee and Tea Intake and Risk of Brain Tumors in the European Prospective Investigation into Cancer and Nutrition (EPIC) Cohort Study

D.S. Michaud, V. Gallo, B. Schlehofer, A. Tjønneland, A. Olsen, K. Overvad, et al.

American Journal of Clinical Nutrition, Vol. 92, No. 5; pp. 1145-1150, 2010

Link to full text: http://www.ajcn.org/content/92/5/1145.full

Significance: An inverse association was found between total coffee and tea consumption and risk of glioma that was consistent with previous findings.

This study examined the relation between coffee and tea intake and the risk of glioma and meningioma. Data on coffee and tea intake were collected from men and women recruited into the EPIC cohort study. Over an average of 8.5 y of follow-up, 343 cases of glioma and 245 cases of meningioma were newly diagnosed in 9 countries. No associations were observed between coffee, tea, or combined coffee and tea consumption and risk of either type of brain tumor when using quantiles based on country-specific distributions of intake. However, a significant inverse association was observed for glioma risk among those consuming ≥100 mL coffee and tea/day compared with those consuming <100 mL/d (hazard ratio: 0.66; 95% CI=0.44-0.97). The association was slightly stronger in men (hazard ratio: 0.59; 95% CI=0.34-1.01) than in women (hazard ratio: 0.74; 95% CI=0.42-1.31).

PCBs

Polychlorinated Biphenyls (PCBs) Contamination and Aryl Hydrocarbon Receptor (AhR) Agonist Activity of Omega-3 Polyunsaturated Fatty Acid Supplements: Implications for Daily Intake of Dioxins and PCBs

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Food and Chemical Toxicology, Vol. 48, No. 11; pp. 3093-3097, 2010

Link to full text: http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6T6P-50PVG55-4-7&_cdi=5036&_user=10&_pii=S0278691510005119&_origin=browse&_coverDate=11%2F30%2F2010&_sk=999519988&view=c&wchp=dGLzVtz-zSkzS&md5=6051cf7ca7f62b10b95ef3a714ed7ddb&ie=/sdarticle.pdf

Significance: The beneficial properties of fish and n-3 PUFA supplements, and the results of this study, suggest that it is prudent to consume supplements derived from small, cold-water fatty fish.

PCB concentrations and aryl hydrocarbon receptor (AhR) agonist activity in 17 omega-3 polyunsaturated fatty acid (n-3 PUFA) supplements available in Canada were investigated. PCBs ranged from <0.8 to 793 ng g^{-1} oil, with salmon- and seal-derived products yielding the highest values. AhR agonist activity from a reporter gene assay ranged from 1.3 to 72.2 pg TEQ g^{-1} oil, with salmon and tuna yielding the highest values. When consumed at the recommended doses and as a supplement to the average Canadian diet, seal-derived oil can contribute to exceedance of the tolerable daily intake of 20 ng PCBs kg-BW^{-1} day^{-1}, and salmon-, tuna-, and sea herring-derived oils can contribute to exceedance of the tolerable daily intake limit of 2.3 pg TEQ kg-BW^{-1} day^{-1}.

Acrylamide

Dietary Acrylamide Exposure and Hemoglobin Adducts – National Health and Nutrition Examination Survey (2003–04)

N.L. Tran, L.M. Barraj, M.M. Murphy, X. Bi

Food and Chemical Toxicology, Vol. 48, No. 11; pp. 3098-3108, 2010

Link to full text: http://www.sciencedirect.com/science?_ob=MImg&_imagekey=B6T6P-50R233N-1-F&_cdi=5036&_user=10&_pii=S0278691510005120&_origin=browse&_coverDate=11%2F30%2F2010&_sk=999519988&view=c&wchp=dGLzVzb-zSkWb&md5=20acffbf87853b1b97bf299721fab08f&ie=/sdarticle.pdf

Significance: There was no association observed between dietary acrylamide and measured acrylamide and glycidamide hemoglobin.

This study evaluated the relationship between dietary acrylamide (AA) and hemoglobin adducts using NHANES, 2003–04. The associations between AA and measured acrylamide (AA–Hb) and glycidamide hemoglobin (Gly–Hb) were evaluated using linear regression models with smoking, age, gender, energy and macronutrient intake, body surface area, and activity level as covariates. Dietary AA positively correlates with AA–Hb and Gly–Hb (p<0.05) but the correlation is small (R^2<3.5%). The incremental increase in AA–Hb and Gly–Hb from average dietary AA is small (7% and 9% for AA–Hb and Gly–Hb, respectively). Non-dietary sources of exposure, measurement errors

associated with the use of the food frequency questionnaire, and uncertainty in the data on AA levels in foods are possible explanations for the observed lack of association between dietary AA and AA–Hb and Gly–Hb.

Caffeine

Caffeine Consumption During Pregnancy and Risk of Preterm Birth: A Meta-Analysis

E. Maslova, S. Bhattacharya, S-W. Lin, K.B. Michels

American Journal of Clinical Nutrition, Vol. 92, No. 5; pp. 1120-1132, 2010

Link to full text: http://www.ajcn.org/content/92/5/1120.full

Significance: No important association between caffeine intake during pregnancy and the risk of preterm birth for cohort and case-control studies was observed.

The association between caffeine consumption during pregnancy and risk of preterm birth was examined in a meta-analysis. The authors searched MEDLINE and EMBASE articles published between 1966 and July 2010, cross-referenced reference lists of the retrieved articles, and identified 15 cohort and 7 case-control studies that met inclusion criteria for this meta-analysis. The combined odds ratios (ORs) obtained by using fixed-effects models for cohort studies were 1.11 (95% CI=0.96-1.28), 1.10 (95% CI=1.01-1.19), and 1.08 (95% CI=0.93-1.27) for risk of preterm birth comparing the highest with the lowest level of caffeine intake (or no intake) (mg/d) during the first, second, and third trimesters, respectively. Results for the case-control studies yielded no associations for the first (OR=1.07; 95% CI=0.84-1.37), second (OR=1.17; 95% CI=0.94-1.45), or third (OR=0.94; 95% CI=0.79-1.12) trimesters. No overall heterogeneity was found by region, publication decade, exposure and outcome assessment, caffeine sources, or adjustment for confounding, which was largely driven by individual studies.

Listeria

Growth Temperature-Dependent Contributions of Response Regulators, σ^B, PrfA, and Motility Factors to *Listeria monocytogenes* Invasion of Caco-2 Cells

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Foodborne Pathogens and Disease, Vol. 7, No. 11; pp. 1337-1349, 2010

Link to full text: http://www.liebertonline.com/doi/full/10.1089/fpd.2010.0563

Significance: Growth temperature affects invasion efficiency and regulation of virulence-associated genes in *L. monocytogenes*.

The effects of *Listeria monocytogenes* growth at different temperatures (30°C vs. 37°C) were characterized on the contributions to Caco-2 invasion of different regulators (including σ^B, PrfA, and 14 response regulators [RRs]) and invasion proteins (InlA and FlaA), and *gadA, plcA, inlA*, and *flaA* transcript levels and their regulation. Overall, Caco-2 invasion efficiency was higher for *L. monocytogenes* grown at 30°C than for bacteria grown at 37°C (p=0.0051); the increased invasion efficiency of the parent strain 10403S (serotype 1/2a) observed after growth at

30°C persisted for 2.5h exposure to 37°C. For *L. monocytogenes* grown at 30°C, the motility RRs DegU and CheY and σ^B, but not PrfA, significantly contributed to Caco-2 invasion efficiency. For *L. monocytogenes* grown at 37°C, none of the 14 RRs tested significantly contributed to Caco-2 invasion, whereas σ^B and PrfA contributed synergistically to invasion efficiency. At both growth temperatures there was significant synergism between the contributions to invasion of FlaA and InlA; this synergism was more pronounced after growth at 30°C than at 37°C.

Inhibition of *Listeria monocytogenes* by Food Antimicrobials Applied Singly and in Combination

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Journal of Food Science, Vol. 75, No. 9; pp. M557–M563, 2010

Link to full text: http://onlinelibrary.wiley.com/doi/10.1111/j.1750-3841.2010.01843.x/full

Combining nisin with acidic calcium sulfate synergistically inhibited *L. monocytogenes*; nisin with lauric arginate ester produced additive-type inhibition, while ε-poly-L-lysine with acidic calcium sulfate produced antagonistic-type inhibition.

A broth dilution assay was used to compare the inhibition of *L. monocytogenes* resulting from exposure to nisin, acidic calcium sulfate (ACS), poly-L-lysine, and lauric arginate ester (LAE) applied singly and in combination. Minimum inhibitory concentrations (MICs) were the lowest concentrations of single antimicrobials producing inhibition following 24hr incubation at 35°C. Minimum bactericidal concentrations (MBCs) were the lowest concentrations that decreased populations by ≥3.0 $\log_{10}$CFU/mL. Combinations of nisin with ACS, nisin with LAE, and -poly-L-lysine with ACS were prepared using a checkerboard assay to determine optimal inhibitory combinations (OICs). Fractional inhibitory concentrations (FICs) were calculated from OICs and were used to create FIC indices (FIC_Is) and isobolograms to classify combinations as synergistic (FIC_I<1.00), additive/indifferent (FIC_I=1.00), or antagonistic (FIC_I>1.00). MIC values for nisin ranged from 3.13-6.25 µg/g with MBC values at 6.25µg/g for all strains except for National Animal Disease Center 2045. MIC values for poly-L-lysine ranged from 6.25-12.50µg/g with MBCs from 12.50-25.00µg/g. LAE at 12.50µg/g was the MIC and MBC for all strains; 12.50mL/L was the MIC and MBC for ACS.

Contamination Patterns of *Listeria monocytogenes* in Cold-Smoked Pork Processing

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Journal of Food Protection, Vol. 73, No. 11; pp. 2103-2109, 2010

Link to abstract: http://www.ingentaconnect.com/content/iafp/jfp/2010/00000073/00000011/art00022

Removal of the brining machine from the production of cold-smoked meat products should be considered to reduce *L. monocytogenes* contamination in the finished products.

Contamination patterns of *Listeria monocytogenes* were studied in a cold-smoked pork processing plant to identify sources and possible reasons for the contamination. Environmental sampling combined with pulsed-field gel electrophoresis (PFGE) subtyping and serotyping were applied to investigate the genetic diversity of *L. monocytogenes* in the plant environment and in ready-to-eat (RTE) cold-smoked pork products. One hundred eight-

three samples were collected for contamination analyses, including 136 samples during manufacture and 47 environmental samples. *L. monocytogenes* isolates, previously recovered from 73 RTE cold-smoked pork samples and collected from the same meat processing plant, were studied. The brining machine and personnel working with brining procedures were the most contaminated places with *L. monocytogenes*. The overall prevalence of *L. monocytogenes* in raw pork (18%) increased to 60% after the brining injections. The brining machine harbored six different PFGE types belonging to serotypes 1/2a, 1/2c, 4b, and 4d, which were found on the feeding teeth, smooth surfaces, and spaces of the machine. Two PFGE types (2 and 8) belonging to serotypes 1/2a and 1/2c were recovered from RTE cold-smoked pork and from surfaces of the brining machine, and may indicate the presence of persistent *L. monocytogenes* strains in the plant.

Thermal Resistance of *Listeria monocytogenes* Scott A in Ultrafiltered Milk as Related to the Effect of Different Milk Components

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Journal of Food Protection, Vol. 73, No. 11; pp. 2110-2115, 2010

Link to abstract: http://www.ingentaconnect.com/content/iafp/jfp/2010/00000073/00000011/art00023

Total solids in ultrafiltered milk, as a single measure, could not be used to predict increased thermal resistance of *L. monocytogenes* in concentrated milk.

The effect of increased dairy solids levels on the thermal resistance of *Listeria monocytogenes* was examined through the use of ultrafiltered (UF) milk, reconstituted milk powder, and the milk components lactose and caseinate. Results showed that lactose and caseinate did not appear to affect thermal resistance. The level of milk fat, up to 10% of the total solids in UF whole milk, did not result in statistically significant changes to thermal resistance when compared with UF skim milk. Reconstituted skim milk powder at 27% total solids (D_{62}-value=1.16±0.2 min, z=5.7) resulted in increased thermal resistance, as compared with reconstituted skim milk powder at 17.5% (D_{62}-value=0.86±0.02 min, z=5.57) and UF whole milk at 27% total solids (D_{62}-value=0.66±0.07 min, z=5.16). However, that increase appeared to be due to the increase in salt levels, not to increases in caseinate, fat, or lactose.

Salmonella

Electrostatic Sprays of Food-Grade Acids and Plant Extracts are More Effective than Conventional Sprays in Decontaminating *Salmonella* Typhimurium on Spinach

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Journal of Food Science, Vol. 75, No. 9; pp. M574–M579, 2010

Link to full text: http://onlinelibrary.wiley.com/doi/10.1111/j.1750-3841.2010.01859.x/full

Malic acid in combination with grape seed extract/lactic acid solutions applied by electrostatic spraying exhibited higher inhibition of pathogens than conventional spraying and can be used for commercial applications to enhance food safety.

This study evaluated the inhibitory properties of malic, tartaric, and lactic acids, and grape seed extract (GSE) alone and in combinations and their application methods against *Salmonella* Typhimurium-inoculated spinach using a response surface method. Fresh spinach leaves were washed, disinfected with sodium hypochlorite solution (0.04% v/v), rewashed with sterile deionized (DI) water, and inoculated with a 2nd-day culture of *S.* Typhimurium (7.0 log CFU/mL). Adhered *S.* Typhimurium population on day 0 was 7.5 log CFU/g. These were treated with individual and combinations of organic acids with GSE or DI water (control) adjusted to the same pH as that of the test solutions with both the modes of application and leaves refrigerated at 4°C. Malic acid (2%) in combination with GSE (3%) or lactic acid (3%) sprayed electrostatically showed reductions of 2.6-3.3 log CFU/g compared to lower log reductions (0.0-0.3 log CFU/g) by day 14 if sprayed conventionally.

Survival and Growth of *Salmonella* in High-Moisture Pecan Nutmeats, In-Shell Pecans, Inedible Nut Components, and Orchard Soil

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Journal of Food Protection, Vol. 73, No. 11; pp. 1975-1985, 2010

Salmonella grows on high-moisture nutmeats and on some of the inedible components of pecans, which emphasizes the importance of controlling or limiting the time pecans are exposed to water in preharvest and postharvest environments.

Link to full text: https://www.ingentaconnect.com/cart/sign-in?url=%2Fcontent%2Fiafp%2Fjfp%2F2010%2F00000073%2F00000011%2Fart00004%3F&payment=1

The survival and growth characteristics of *Salmonella* on high-moisture (water activity of 0.96-0.99) pecan nutmeats, in-shell pecans, and inedible components (shuck, shell, and middle septum tissue) of in-shell pecans were investigated. *Salmonella* did not grow on high-moisture nutmeat halves, pieces, or granules stored at 4°C for up to 48hrs. Growth occurred at 21, 30, and 37°C. Increases of 1.77-5.87 log CFU/g of nutmeats occurred within 48hrs at 37°C; the order in which nutmeats supported growth was granules > pieces > halves. Populations of *Salmonella* on and in high-moisture in-shell pecans (kernel water activity of 0.94) stored at 4, 21, 30, and 37°C for 8 days decreased by 0.52-1.19 log CFU/g. The pathogen grew on the surface of high-moisture pecan shucks and shells but died on middle septum tissue stored at 21, 30, and 37°C for up to 6 days. *Salmonella* died in water extracts of shucks and in pecan orchard soil saturated with water or shuck extract, but survived well for at least 18 weeks in dry soil.

Inhibition of Nalidixic Acid-Resistant *Salmonella* on Marinated Chicken Skin

A. Pathania, S.R. McKee, S.F. Bilgili, M. Singh

Journal of Food Protection, Vol. 73, No. 11; pp. 2072-2078, 2010

Link to abstract: http://www.ingentaconnect.com/content/iafp/jfp/2010/00000073/00000011/art00016

Marination of chicken skin with teriyaki marinade greatly reduced *Salmonella* prevalence and survival regardless of the storage temperature.

A series of experiments were conducted to determine the efficacy of teriyaki and lemon pepper marinades against multiple strains of nalidixic acid (NAL)-resistant *Salmonella* on poultry meat. NAL-resistant *Salmonella* serovar cultures were inoculated onto chicken skin at 0.6-3.14 log CFU/g in a 12-well titer plate. Inoculated chicken skin was exposed to teriyaki or lemon pepper marinades for up to 32hrs and stored at 4 or 25°C to determine the prevalence of *Salmonella.* To determine *Salmonella* survival, a three-strain cocktail of *Salmonella* was inoculated at low (ca. 4 log CFU/g) and high (8 log CFU/g) levels onto chicken skin that was then marinated with either teriyaki or lemon pepper marinade for up to 32hrs and stored at 4 or 25°C. Prevalence of *Salmonella* was significantly reduced by teriyaki marinade at all levels of contamination regardless of storage temperature. Lemon pepper marinade reduced *Salmonella* prevalence at low levels of contamination (10^1 and 10^2 CFU/g), whereas no significant effect was observed at higher levels of contamination.

E. Coli

Multiplex Polymerase Chain Reaction Assay for Detection of Nonserotypable Shiga Toxin–Producing *Escherichia coli* Strains of Serogroup O147

C. DebRoy, E. Roberts, M. Davis, A. Bumbaugh

Foodborne Pathogens and Disease, Vol. 7, No. 11; pp. 1407-1414, 2010

Link to full text: http://www.liebertonline.com/doi/full/10.1089/fpd.2010.0614

The multiplex PCR method will allow identifying potentially pathogenic subgroup of STEC important in porcine and human health.

Nonserotypable Shiga toxin–producing *Escherichia coli* (STEC) strains (*n*=72) from the collection of the *E. coli* Reference Center were O typed by a polymerase chain reaction (PCR)–restriction fragment length polymorphism method, and those that exhibited similar profiles (*n*=17) were chosen for the study. These isolates, derived from pigs, carried genes for Shiga toxin variant 2e (100%), heat stable enterotoxins STa and STb (70% and 76%, respectively), and F107 (F18) fimbriae (82%). DNA sequencing and analysis of the O-antigen gene cluster of one of the nonserotypable strains exhibited 100% homology with O-antigen cluster of *E. coli* O147. Scanning electron micrographs of the nonserotypable strains showed altered morphology as compared to *E. coli* O147. Therefore, nonserotypable strains may share 100% homology with O-antigen gene cluster of a certain serogroup but may not express that specific O-antigen. Highly specific multiplex PCR for detecting the nonserotypable STEC of serogroup O147 was developed targeting virulence genes *stx*2, *stb*, and *fedA* encoding for F107 fimbriae, and *wzx* and *wzy* of the O147 O-antigen cluster genes.

Understanding the Role of Agricultural Practices in the Potential Colonization and Contamination by *Escherichia coli* in the Rhizospheres of Fresh Produce

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Journal of Food Protection, Vol. 73, No. 11; pp. 2001-2009, 2010

Link to full text: https://www.ingentaconnect.com/cart/sign-in?url=%2Fcontent%2Fiafp%2Fjfp%2F2010%2F00000073%2F00000011%2Fart00007%3F&payment=1

Escherichia coli strains expressing bioluminescence (*E. coli* O157:H7 *lux*) or multiantibiotic resistance (*E. coli*$^{2+}$)

E. coli is mobile in the plant system and responds to the rhizosphere like other bacteria.

were used in this study. When radish and lettuce seeds were treated with *E. coli* O157:H7 *lux* and grown in an agar-based growth system, rapid bacterial colonization of the germinating seedlings and high levels of microbial activity were seen. Introduction of *E. coli*$^{2+}$ to soil via manure or via manure in irrigation water showed that *E. coli* could establish itself in the lettuce rhizosphere. Fifteen days subsequent to its establishment in the rhizosphere, *E. coli*$^{2+}$ was detected on the phyllosphere of lettuce at a mean of 2.5 log CFU/g. When *E. coli*$^{2+}$ was introduced 17 and 32 days postseeding to untreated soil (rather than the plant surface) via irrigation, it was detected at low levels (1.4 log CFU/g) on the lettuce phyllosphere 10 days later. While *E. coli*$^{2+}$ persisted in the bulk and rhizosphere soil throughout the study period (day 41), it was not detected on the external portions of the phyllosphere after 27 days.

Foodborne Pathogens

Quantitative Risk from Fluoroquinolone-Resistant *Salmonella* and *Campylobacter* Due to Treatment of Dairy Heifers with Enrofloxacin for Bovine Respiratory Disease

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Foodborne Pathogens and Disease, Vol. 7, No. 11; pp. 1305-1322, 2010

Link to full text: http://www.liebertonline.com/doi/full/10.1089/fpd.2010.0550

The mean annual increased risk of cases where compromised fluoroquinolone treatment resulted in persistent symptoms was one case every 293 yrs, 158 yrs and 13 yrs for *Salmonella*, MDR *Salmonella* and *Campylobacter*, respectively.

This study evaluated the human health impact of using fluoroquinolones to treat bovine respiratory disease (BRD) in dairy heifers <20 months of age, and it quantified the probability of persistent symptoms in humans treated with a fluoroquinolone, for a fluoroquinolone-resistant *Campylobacter*, *Salmonella*, or multidrug-resistant (MDR) *Salmonella* infection acquired following the consumption of ground beef. For exposure, human foodborne exposure to *Campylobacter*, *Salmonella*, and MDR *Salmonella* after consumption of ground beef was estimated. The consequence assessment included illness, fluoroquinolone treatment, and persistent symptoms in patients treated with a fluoroquinolone. A scenario analysis was performed to evaluate the uncertainty of the following parameters:

(1) probability of resistance development in treated animals, (2) portion of illnesses attributable to ground beef, and (3) probability of persistent symptoms in patients ≥18yrs of age treated with a fluoroquinolone.

***Lactobacillus Fermentum* Isolated from Human Colonic Mucosal Biopsy Inhibits the Growth and Adhesion of Enteric and Foodborne Pathogens**

P. Varma, K.R. Dinesh, K.K. Menon, R. Biswas

Journal of Food Science, Vol. 75, No. 9, pp. M546–M551, 2010

Link to full text: http://onlinelibrary.wiley.com/doi/10.1111/j.1750-3841.2010.01818.x/full

L. fermentum produces antimicrobial compounds and surface associated proteins to inhibit the growth and adhesion of enteropathogens, respectively.

L. fermentum was isolated from human colonic mucosal biopsy samples that possess antimicrobial activities against entroinvasive and foodborne pathogens such as *Escherichia coli*, *Salmonella paratyphi A*, *Shigella sonnei*, *Staphylococcus aureus*, *Enterococcus faecalis*, *Proteus mirabilis*, *Pseudomonas aeruginosa*, and *Vibrio* sp. In addition to lactic acid, *L. fermentum* secretes antimicrobial proteinacious compound(s) that was found to be active even at neutral pH (pH 7.0). The compound was sensitive to heat treatment and trypsin digestion. *Lactobacillus fermentum* inhibited the adhesion of enteropathogens to intestinal epithelial cells *in vitro*. Isolated cell surface associated proteins (SAPs) from *L. fermentum* were sufficient for the adhesion exclusions of enteropathogenic *E. coli.*

Effect of NaCl on the Biofilm Formation by Foodborne Pathogens

H. Xu, Y. Zou, H-Y. Lee, J. Ahn

Journal of Food Science, Vol. 75, No. 9; pp. M580–M585, 2010

Link to full text: http://onlinelibrary.wiley.com/doi/10.1111/j.1750-3841.2010.01865.x/full

This study provides useful information to better understand the adhesion and detachment capability of foodborne pathogens on food contact surfaces.

This study was designed to evaluate the effect of NaCl on the biofilm formation of *Listeria monocytogenes*, *Staphylococcus aureus*, *Shigella boydii*, and *Salmonella* Typhimurium. Most strains showed 2 distinctive phases at lower than 6% NaCl, while the numbers of adhered cells gradually increased throughout the incubation period at 4%-10% NaCl. At 0% NaCl, the numbers of adhered *L. monocytogenes*, *S. aureus*, *S. boydii*, and *S.* Typhimurium cells rapidly increased up to 7.04, 6.47, 6.39, and 7.27 log CFU/cm^2, respectively, within 4d of incubation. The maximum growth rate (k_A) and specific growth rate (μ_A) of adherent pathogenic cells were decreased with increasing NaCl concentration. Noticeable decline in the numbers of adherent cells was observed at low concentration levels of NaCl (<2%). The adherence abilities of foodborne pathogens were influenced by the physicochemical surface properties. The hydrophobicity and auto-aggregation enhanced the biofilm formation during the incubation periods.

Effectiveness of Pulsed Ultraviolet-Light Treatment for Bacterial Inactivation on Agar Surface and Liquid Medium

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Foodborne Pathogens and Disease, Vol. 7, No. 11; pp. 1401-1406, 2010

Link to full text: http://www.liebertonline.com/doi/full/10.1089/fpd.2010.0594

Significance: Pulsed ultraviolet-light can be used as an effective sterilizing method for the bacteria.

The efficiency of a broad-spectrum pulsed ultraviolet (UV)-light for the inactivation of *Listeria monocytogenes* Scott A, *L. monocytogenes* CNL 895807, and *Pseudomonas fluorescens* MF37 populations as agar seeded or suspended cells was investigated. The bacterial populations were treated by pulsed UV-light at different number of pulses (1 to 3), dose of energy (162, 243, or 324J), and distance from the strobe (4, 9, or 12cm). After pulsed UV-light treatment, the bacterial reduction was determined by standard plate count. There was a significant reduction of population along with an increase of light energy and number of pulses. Decreasing the distance between the Petri dishes and the xenon lamp demonstrated an increase in bacterial reduction. Decontamination efficacy decreased significantly with the increase in level of contamination.