Tina Birk - DTU Orbit (27/05/2018)
Tina Birk

Organisations

Research Group for Microbial Food Safety and Quality
19/05/2015 → 12/07/2016 Former
VIP

Division of Food Microbiology
29/06/2012 → 19/05/2015 Former
VIP

Associate Professor, National Food Institute
12/03/2008 → present
tibir@food.dtu.dk
VIP

Research Group for Microbial Food Safety
12/07/2016 → present
VIP

Publications:

Growth parameter estimates of *Listeria monocytogenes* in cooked chicken: Effect of preparation of inoculum

**General information**
State: Published
Organisations: National Food Institute, Research Group for Microbial Food Safety
Authors: Birk, T. (Intern), Smith Ottosen, S. (Ekstern), Hansen, T. B. (Intern)
Pages: 66-66
Publication date: 2017

**Host publication information**
Title of host publication: The Danish Microbiological Society Annual Congress 2017 - Programme & Abstracts
Place of publication: Copenhagen, Denmark
Publisher: American Society for Microbiology
Article number: P55
Main Research Area: Technical/natural sciences
Conference: Danish Microbiological Society 2017 Congress, Copenhagen, Denmark, 13/11/2017 - 13/11/2017
Electronic versions:
ABSTRACT BOOK
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2017

Growth parameter estimates of *Listeria monocytogenes* in cooked chicken: effect of preparation of inoculum

**General information**
State: Published
Organisations: National Food Institute, Research Group for Microbial Food Safety, University College Zealand
Authors: Birk, T. (Intern), Smith Ottosen, S. (Ekstern), Hansen, T. B. (Intern)
Number of pages: 1
Publication date: 2017

**Host publication information**
Title of host publication: 10th International conference on predictive modelling in food
Place of publication: Cordoba, Spain
Main Research Area: Technical/natural sciences
Conference: 10th International Conference on Predictive Modelling in Food, Cordoba, Spain, 26/09/2017 - 26/09/2017
Electronic versions:
abstract_poster_P17.pdf
Source: PublicationPreSubmission
Source-ID: 140541315
Growth parameter estimates of Listeria monocytogenes in cooked chicken: effect of preparation of inoculum

General information
State: Published
Organisations: National Food Institute, Research Group for Microbial Food Safety, University College Zealand
Authors: Birk, T. (Intern), Smith Ottosen, S. (Ekstern), Hansen, T. B. (Intern)
Number of pages: 1
Publication date: 2017
Event: Poster session presented at 10th International Conference on Predictive Modelling in Food, Cordoba, Spain.
Main Research Area: Technical/natural sciences
Electronic versions: poster_ICPMF10_tibha_220817.pdf

Methods for Isolation, Purification, and Propagation of Bacteriophages of Campylobacter jejuni
Here, we describe the methods for isolation, purification, and propagation of Campylobacter jejuni bacteriophages from samples expected to contain high number of phages such as chicken feces. The overall steps are (1) liberation of phages from the sample material; (2) observation of plaque-forming units on C. jejuni lawns using a spot assay; (3) isolation of single plaques; (4) consecutive purification procedures; and (5) propagation of purified phages from a plate lysate to prepare master stocks.

General information
State: Published
Organisations: National Food Institute, Research Group for Microbial Food Safety
Authors: Gencay, Y. E. (Ekstern), Birk, T. (Intern), Sørensen, M. C. H. (Ekstern), Brøndsted, L. (Ekstern)
Number of pages: 10
Pages: 19-28
Publication date: 2017

Host publication information
Title of host publication: Campylobacter jejuni - methods and protocols
Publisher: Springer Science+Business Media
Editors: Butcher, J., Stintzi, A.
ISBN (Electronic): 978-1-4939-6536-6
Chapter: 3
Series: Methods in Molecular Biology
Number: 1512
ISSN: 1064-3745
Main Research Area: Technical/natural sciences
Bacteriophage, C. jejuni, Campylobacter, Isolation, Propagation, Purification, Titration
Source: FindIt
Source-ID: 2349281127
Publication: Research - peer-review » Book chapter – Annual report year: 2017

Transmission of extended-spectrum cephalosporin (ESC) resistance through the broiler production system in Denmark

General information
State: Published
Organisations: National Food Institute, Research Group for Microbial Food Safety, Research Group for Genomic Epidemiology, Danish Veterinary and Food Administration
Authors: Jensen, L. B. (Intern), Birk, T. (Intern), Hendriksen, R. S. (Intern), Ortved Bjergager, G. (Ekstern), Lundsby, K. (Ekstern), Aabo, S. (Intern)
Pages: 83-83
Publication date: 2017

Host publication information
Title of host publication: The Danish Microbiological Society Annual Congress 2017 - Programme & Abstracts
Place of publication: Copenhagen, Denmark
Publisher: American Society for Microbiology
Article number: P81
Growth potential of exponential- and stationary-phase Salmonella Typhimurium during sausage fermentation

Raw meat for sausage production can be contaminated with Salmonella. For technical reasons, meat is often frozen prior to mincing but it is unknown how growth of Salmonella in meat prior to freezing affects its growth potential during sausage fermentation. We investigated survival of exponential- and stationary-phase Salmonella Typhimurium (DT12 and DTU292) during freezing at −18 °C and their subsequent growth potential during 72 h sausage fermentation at 25 °C. After 0, 7 and >35 d of frozen storage, sausage batters were prepared with NaCl (3%) and NaNO2 (0, 100 ppm) and fermented with and without starter culture. With no starter culture, both strains grew in both growth phases. In general, a functional starter culture abolished S. Typhimurium growth independent of growth phase and we concluded that ensuring correct fermentation is important for sausage safety. However, despite efficient fermentation, sporadic growth of exponential-phase cells of S. Typhimurium was observed drawing attention to the handling and storage of sausage meat.

General information
State: Published
Organisations: National Food Institute, Research Group for Microbial Food Safety, Technical University of Denmark
Authors: Birk, T. (Intern), Henriksen, S. (Intern), Müller, K. (Ekstern), Hansen, T. B. (Intern), Aabo, S. (Intern)
Number of pages: 8
Pages: 342-349
Publication date: 2016
Main Research Area: Technical/natural sciences

Publication information
Journal: Meat Science
Volume: 121
ISSN (Print): 0309-1740
Ratings:
BFI (2018): BFI-level 2
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 2
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 2
Scopus rating (2016): CiteScore 3.33 SJR 1.734 SNIP 1.945
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 2
Scopus rating (2015): SJR 1.92 SNIP 1.85 CiteScore 3.04
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 2
Scopus rating (2014): SJR 1.488 SNIP 1.878 CiteScore 2.94
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 1.506 SNIP 1.848 CiteScore 2.9
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 1.655 SNIP 1.884 CiteScore 2.84
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 1.761 SNIP 1.797 CiteScore 2.75
ISI indexed (2011): ISI indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 1.547 SNIP 1.621
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Scopus rating (2009): SJR 1.34 SNIP 1.511
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 2
Scopus rating (2008): SJR 1.298 SNIP 1.409
Web of Science (2008): Indexed yes
Scopus rating (2007): SJR 1.026 SNIP 1.628
Web of Science (2007): Indexed yes
Scopus rating (2006): SJR 1.144 SNIP 1.634
Scopus rating (2005): SJR 0.84 SNIP 1.533
Web of Science (2005): Indexed yes
Scopus rating (2004): SJR 1.079 SNIP 1.692
Web of Science (2004): Indexed yes
Scopus rating (2003): SJR 0.782 SNIP 1.554
Web of Science (2003): Indexed yes
Scopus rating (2002): SJR 0.782 SNIP 1.286
Scopus rating (2001): SJR 0.851 SNIP 1.278
Web of Science (2001): Indexed yes
Scopus rating (2000): SJR 0.772 SNIP 1.447
Web of Science (2000): Indexed yes
Scopus rating (1999): SJR 0.727 SNIP 1.286
Original language: English
Fermented sausages, Freezing, Growth phase, Salmonella, Sodium nitrite, Starter culture, Food Science, Fermentation, Food processing, Meats, Phase transitions, Thermal processing (foods), Exponential phase, Growth potential, Salmonella typhimurium, Starter cultures, Stationary phase
DOIs:
10.1016/j.meatsci.2015.08.012
Source: FindIt
Source-ID: 2280663213
Publication: Research - peer-review › Journal article – Annual report year: 2016

Horizontal transfer of antimicrobial resistance in meat

General information
State: Published
Organisations: National Food Institute, Research Group for Microbial Food Safety, Technical University of Denmark
Authors: Jensen, L. B. (Intern), Birk, T. (Intern), Fuentes, M. A. F. (Ekstern), Aabo, S. (Intern)
Pages: 48-48
Publication date: 2016

Host publication information
Title of host publication: The Danish Microbiological Society Annual Congress 2016 : Programme & Abstracts
Place of publication: Copenhagen
Publisher: American Society for Microbiology
Article number: P24
Main Research Area: Technical/natural sciences
Conference: Danish Microbiological Society Annual Congress 2016, Copenhagen, Denmark, 14/11/2016 - 14/11/2016
Electronic versions:
Programme & Abstracts book
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2016

DANMAP 2014 - Use of antimicrobial agents and occurrence of antimicrobial resistance in bacteria from food animals, food and humans in Denmark

General information
State: Published
Organisations: National Food Institute, Division of Risk Assessment and Nutrition , Research Group for Microbial Food Safety and Quality, Research Group for Genomic Epidemiology, State Serum Institute, Statens Serum Institut
Authors: Bager, F. (Intern), Birk, T. (Intern), Borck Høg, B. (Intern), Jensen, L. B. (Intern), Jensen, A. N. (Intern), de Knegt, L. (Intern), Korsgaard, H. (Intern), Dalby, T. (Ekstern), Hammerum, A. (Ekstern), Hoffmann, S. (Ekstern), Gaardbo Kuhn, K. (Ekstern), Rhod Larsen, A. (Ekstern), Laursen, M. (Ekstern), Nielsen, E. M. (Ekstern), Schytte Olsen, S. (Ekstern),
Primary Isolation Strain Determines Both Phage Type and Receptors Recognised by Campylobacter jejuni Bacteriophages

In this study we isolated novel bacteriophages, infecting the zoonotic bacterium Campylobacter jejuni. These phages may be used in phage therapy of C. jejuni colonized poultry to prevent spreading of the bacteria to meat products causing disease in humans. Many C. jejuni phages have been isolated using NCTC12662 as the indicator strain, which may have biased the selection of phages. A large group of C. jejuni phages rely on the highly diverse capsular polysaccharide (CPS) for infection and recent work identified the O-methyl phosphoramidate modification (MeOPN) of CPS as a phage receptor. We therefore chose seven C. jejuni strains each expressing different CPS structures as indicator strains in a large screening for phages in samples collected from free-range poultry farms. Forty-three phages were isolated using C. jejuni NCTC12658, NCTC12662 and RM1221 as host strains and 20 distinct phages were identified based on host range analysis and genome restriction profiles. Most phages were isolated using C. jejuni strains NCTC12662 and RM1221 and interestingly phage genome size (140 kb vs. 190 kb), host range and morphological appearance correlated with the
isolation strain. Thus, according to C. jejuni phage grouping, NCTC12662 and NCTC12658 selected for CP81-type phages, while RM1221 selected for CP220-type phages. Furthermore, using acapsular Delta kpsM mutants we demonstrated that phages isolated on NCTC12658 and NCTC12662 were dependent on the capsule for infection. In contrast, CP220-type phages isolated on RM1221 were unable to infect non-motile Delta motA mutants, hence requiring motility for successful infection. Hence, the primary phage isolation strain determines both phage type (CP81 or CP220) as well as receptors (CPS or flagella) recognised by the isolated phages.
Buffer capacity of food components influences the acid tolerance response in Salmonella Typhimurium during simulated gastric passage

Food composition, buffer capacity, and fat and protein content have been shown to effect the gastric acid survival of pathogens (Waterman & Small 1998). In this study, simple food-model substances with different buffer capacities were investigated for their ability to support survival of stationary phase Salmonella Typhimurium during simulated gastric acid passage. We used a computer-controlled fermentor to employ pH changes in synthetic gastric fluid, mimicking the dynamic pH during gastric passage. In order to minimise variation, Salmonella enterica serovar Typhimurium was contained in dialysis tubes, enabling simultaneous testing of biological triplicates under varying conditions. Surprisingly, we found that less buffered media provided higher protection of Salmonella, compared to media with high buffer capacity. By investigating the relative gene expression of rpoS and ompR encoding for two major stationary phase ATR regulators, we found an approx. four-fold increase in expression of ompR and an approx. three-fold increase of rpoS in saline and buffered saline, respectively, after 15 min of gastric acid challenge. The relative expression of these genes, were significantly lower in Brain Heart Infusion Broth having a higher buffer capacity. We suggest this to be associated with a varying ability of Salmonella Typhimurium to mount a stationary phase acid tolerance response (ATR) depending on the buffer capacity of the food vehicle.
Buffer capacity of food components influences the acid tolerance response in Salmonella Typhimurium during simulated gastric passage

General information
State: Published
Organisations: National Food Institute, Division of Food Microbiology
Authors: Aabo, S. (Intern), Buschhardt, T. (Intern), Hansen, T. B. (Intern), Birk, T. (Intern), Henriksen, S. (Intern)
Number of pages: 1
Publication date: 2014
Event: Poster session presented at The Danish Microbiological Society Annual Congress 2014, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Electronic versions:
Buffer_capacity_poster.pdf
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2014

Collaboration between courses in the interdisciplinary course Food Microbiology
Food Microbiology is an interdisciplinary 12.5 ETCS second-year) course in a CDIO-based Bachelor of Engineering program in Food Science at The Technical University of Denmark (DTU). The course was first offered in 2011. Each session in the Food Microbiology course combines theory and practice in order to strengthen the students’ application-oriented competences and engagement. In this paper the results from the evaluation of the course will be presented and a discussion will be carried out about how the students responded to the multidisciplinary, real-life projects and how it affects student learning.

The aims of this study were to test 1) the students’ perception combining theory with small laboratory exercises and 2) the students’ perception of how the course collaborates with and combines theories and practices from other current semester courses. The students evaluated the course in general using the Course Experience Questionnaire (Ramsden, 1991) and by answering a questionnaire concerning the collaboration between the other courses.

It can be concluded that the combination of: theory/laboratory exercises/report writing stimulated the students’ motivation and that collaboration between other mandatory semester courses mainly was rated positively by the students.

General information
State: Published
Organisations: National Food Institute, Division of Food Microbiology, Office for Study Programmes and Student Affairs
Authors: Birk, T. (Intern), Jensen, L. B. (Intern), Andersson, P. H. (Intern)
Number of pages: 8
Publication date: 2014

Host publication information
Title of host publication: Proceedings of the 10th international CDIO conference
Place of publication: Barcelona, Spain
Publisher: CDIO
Main Research Area: Technical/natural sciences
Conference: 10th International CDIO Conference, Barcelona, Spain, 15/06/2014 - 15/06/2014
Interdisciplinary, Collaboration, Motivation, Evaluation, CDIO standards, 6 and 8
Electronic versions:
59_Paper.pdf

Relations
Activities:
10th International CDIO Conference
10th International CDIO Conference
Source: PublicationPreSubmission
Source-ID: 103341760
Predicting safe sandwich production

Time and temperature control is crucial to avoid growth of pathogens during production and serving of cold ready-to-eat meals. The Danish guidelines state that chilled foods, such as sandwiches, should not be outside the cold chain for more than 3 hours including the time for preparation and serving. However, Danish sandwich producing companies find it challenging to comply with this and have expressed a need for more flexibility. The Danish guidelines do allow for a prolongation of the acceptable time outside the cold chain, if the safety of the specific production can be documented. There is, therefore, room for developing targeted tools for evaluating the time-temperature scenarios in sandwich production. This study describes a decision support tool developed to offer the producers more flexibility. Based on time/temperature measurements obtained during preparation combined with information on the prehistory of ingredients and the expected time/temperature conditions of distribution and serving, the potential growth of Listeria monocytogenes, Salmonella and psychrotrophic Clostridium botulinum in the sandwiches is predicted. Applying the lag times of these pathogens as the critical limit, the tool determines if the sandwich production is safe by evaluating whether any of the lag times have been exceeded during the total preparation, distribution, and serving time. The growth models employed were built as part of the study using a “worst case” ingredient.

General information
State: Published
Organisations: National Food Institute, Division of Food Microbiology, Division of Industrial Food Research
Authors: Birk, T. (Intern), Duan, Z. (Intern), Møller, C. O. D. A. (Intern), Hansen, T. B. (Intern), Friis Hansen, H. (Ekstern), Knøchel, S. (Ekstern)
Pages: 27
Publication date: 2014

Host publication information
Title of host publication: The Danish Microbiological Society Annual Congress 2014 : program & Abstracts
Place of publication: Copenhagen
Article number: P15
Main Research Area: Technical/natural sciences
Isolation and characterization of Campylobacter jejuni bacteriophages from free-range poultry farms using different Penner serotypes expressing a variety of surface structures

General information
State: Published
Organisations: National Food Institute, Division of Food Microbiology, University of Copenhagen
Authors: Emre Gencay, Y. (Ekstern), Holst Sørensen, M. C. (Ekstern), Birk, T. (Intern), Berg Baldvinsson, S. (Ekstern), Bak Christensen, B. (Ekstern), Brendsted, L. (Ekstern)
Pages: 97
Publication date: 2013

Host publication information
Title of host publication: CHRO 2013: 17th International Workshop on Campylobacter, Helicobacter and Related Organisms
Place of publication: United Kingdom
Publisher: University of Aberdeen
Main Research Area: Technical/natural sciences
Workshop: 17th International Workshop on Campylobacter, Helicobacter and Related Organisms, Aberdeen, United Kingdom, 15/09/2013 - 15/09/2013
Electronic versions:
CHROfinal.pdf
Links:
http://jmm.sgmjournals.org/content/suppl/2013/08/30/62.Pt_9.DC1/CHROfinal.pdf

Acid stress response and protein induction in Campylobacter jejuni isolates with different acid tolerance.

BACKGROUND:
During the transmission route from poultry to the human host, the major foodborne pathogen C. jejuni may experience many types of stresses, including low pH caused by different acids. However, not all strains are equally sensitive to the stresses. The aim of this study was to investigate the response to acid stress of three sequenced C. jejuni strains with different acid tolerances using HCl and acetic acid.

RESULTS:
Two-dimensional gel electrophoresis was used for proteomic analysis and proteins were radioactively labelled with methionine to identify proteins only related to acid exposure. To allow added radioactive methionine to be incorporated into induced proteins, a modified chemically defined broth was developed with the minimal amount of methionine necessary for satisfactory growth of all strains. Protein spots were analyzed using image software and identification was done with MALDI-TOF-TOF. The most acid-sensitive isolate was C. jejuni 327, followed by NCTC 11168 and isolate 305 as the most tolerant. Overall, induction of five proteins was observed within the pH range investigated: 19 kDa periplasmic protein (p19), thioredoxin-disulfide (TrxB), a hypothetical protein Cj0706 (Cj0706), molybdenum cofactor biosynthesis protein (MogA), and bacterioferritin (Dps). Strain and acid type dependent differences in the level of response were observed. For strain NCTC 11168, the induced proteins and the regulator fur were analysed at the transcriptomic level using qRT-PCR. In this transcriptomic analysis, only up-regulation of trxB and p19 was observed.

CONCLUSIONS:
A defined medium that supports the growth of a range of Campylobacter strains and suitable for proteomic analysis was developed. Mainly proteins normally involved in iron control and oxidative stress defence were induced during acid stress of C. jejuni. Both strain and acid type affected sensitivity and response.

General information
State: Published
Organisations: Division of Epidemiology and Microbial Genomics, National Food Institute, Division of Food Microbiology, University of Copenhagen
Authors: Birk, T. (Intern), Wik, M. T. (Ekstern), Lametsch, R. (Forskerdatabase), Knøchel, S. (Ekstern)
Publication date: 2012
Main Research Area: Technical/natural sciences
Dietary proteins extend the survival of salmonella dublin in a gastric acid environment.

The pH of the human stomach is dynamic and changes over time, depending on the composition of the food ingested and a number of host-related factors such as age. To evaluate the number of bacteria surviving the gastric acid barrier, we have developed a simple gastric acid model, in which we mimicked the dynamic pH changes in the human stomach. In the present study, model gastric fluid was set up to imitate pH dynamics in the stomachs of young and elderly people after ingestion of a standard meal. To model a serious foodborne pathogen, we followed the survival of Salmonella enterica serotype Dublin, and found that the addition of proteins such as pepsin, ovalbumin, and blended turkey meat to the simple gastric acid model significantly delayed pathogen inactivation compared with the control, for which no proteins were added. In contrast, no delay in inactivation was observed in the presence of bovine serum albumin, indicating that protection could be protein specific. The simple gastric acid model was validated against a more laborious and complex fermenter model, and similar survival of Salmonella Dublin was observed in both models. Our gastric acid model allowed us to evaluate the influence of food components on survival of pathogens under gastric conditions, and the model could contribute to a broader understanding of the impact of specific food components on the inactivation of pathogens during gastric passage.
Evaluation of growth potential of Listeria monocytogenes and Salmonella in a sandwich environment

General information
State: Published
Organisations: National Food Institute, Division of Food Microbiology
Authors: Birk, T. (Intern), Møller, C. (Intern), Bollerslev, A. M. (Intern), Aabo, S. (Intern), Karapetian, D. (Intern), Hansen, T. B. (Intern)
Number of pages: 1
Pages: 46
Publication date: 2012

Host publication information
Title of host publication: 2012 Symposium of The Danish Microbiological Society
Publisher: DMS
Main Research Area: Technical/natural sciences
Conference: 2012 Symposium of The Danish Microbiological Society, Copenhagen, Denmark, 05/11/2012

Bibliographical note
P60
Publication: Research - peer-review › Conference abstract in proceedings – Annual report year: 2012

Evaluation of growth potential of Listeria monocytogenes and Salmonella in a sandwich environment

General information
State: Published
Organisations: National Food Institute, Division of Food Microbiology
Evaluation of growth potential of Listeria monocytogenes and Salmonella in a sandwich environment

General information
State: Published
Organisations: National Food Institute, Division of Food Microbiology
Authors: Birk, T. (Intern), Bollerslev, A. M. (Intern), Møller, C. (Intern), Aabo, S. (Intern), Hansen, T. B. (Intern)
Number of pages: 1
Publication date: 2012
Main Research Area: Technical/natural sciences
Electronic versions:
11.pdf
Publication: Research - peer-review › Poster – Annual report year: 2013

Survival and Growth of Epidemically Successful and Nonsuccessful Salmonella enterica Clones after Freezing and Dehydration.

The spread of epidemically successful nontyphoidal Salmonella clones has been suggested as the most important cause of salmonellosis in industrialized countries. Factors leading to the emergence of success clones are largely unknown, but their ability to survive and grow after physical stress may contribute. During epidemiological studies, a mathematical model was developed that allowed estimation of a factor (q) accounting for the relative ability of Salmonella serovars with different antimicrobial resistances to survive in the food chain and cause human disease. Based on this q-factor, 26 Salmonella isolates were characterized as successful or nonsuccessful. We studied the survival and growth of stationary- and exponential-phase cells of these isolates after freezing for up to 336 days in minced meat. We also investigated survival and growth after dehydration at 10°C and 82% relative humidity (RH) and 25°C and 49% RH for 112 days. Stationary-phase cells were reduced by less than 1 log unit during 1 year of freezing, and growth was initiated with an average lag phase of 1.7 h. Survival was lower in exponentialphase cells, but lag phases tended to be shorter. High humidity and low temperature were less harmful to Salmonella than were low humidity and high temperature. Tolerance to adverse conditions was highest for Salmonella Infantis and one Salmonella Typhimurium U292 isolate and lowest for
Salmonella Derby and one Salmonella Typhimurium DT170 isolate. Dehydration, in contrast to freezing, was differently tolerated by the Salmonella strains in this study, but tolerance to freezing and dehydration does not appear to contribute to the emergence of successful Salmonella clones.
Biophysical Evaluation of Food Decontamination Effects on Tissue and Bacteria

Traditionally, the effects and efficiency of food surface decontamination processes, such as chlorine washing, radiation, or heating, have been evaluated by sensoric analysis and colony-forming unit (CFU) counts of surface swabs or carcass rinses. These methods suffice when determining probable consumer responses or meeting legislative contamination limits. However, in the often very costly, optimization process of a new method, more quantitative and unbiased results are invaluable. In this study, we employed a biophysical approach for the investigation of qualitative and quantitative changes in both food surface and bacteria upon surface decontamination by SonoSteam®. SonoSteam® is a recently developed method of food surface decontamination, which employs steam and ultrasound for effective heat transfer and short treatment times, resulting in significant reduction in surface bacteria. We employ differential scanning calorimetry, second harmonics generation imaging microscopy, two-photon fluorescence microscopy, and green fluorescence protein-expressing bacteria and compare our results with those obtained by traditional methods of food quality and safety evaluations. Our results show that there are no contradictions between data obtained by either approach. However, the biophysical methods draw a much more nuanced picture of the effects and efficiency of the investigated decontamination method, revealing, e.g., an exponential dose/response relationship between SonoSteam® treatment time and changes in collagen I, and a depth dependency in bacterial reduction, which points toward CFU counts overestimating total bacterial reduction. In conclusion, the biophysical methods provide a less biased, reproducible, and highly detailed system description, allowing for focused optimization and method validation.
Growth and survival of exponential and stationary phase Salmonella during sausage fermentation

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Müller, K. (Intern), Hansen, T. B. (Intern), Aabo, S. (Intern)
Number of pages: 416
Publication date: 2011

Host publication information
Title of host publication: Safepork 2011 : Abstract book
Main Research Area: Technical/natural sciences
Conference: 9th International Conference on the Epidemiology and Control of Biological Chemical and Physical Hazards in Pigs and Pork, Maastricht, Netherlands, 19/06/2011 - 19/06/2011
Electronic versions:
plugin-SP010_abstractbook_web_140611.pdf
Links:
http://www.safepork.org/
Source: orbit
Source-ID: 277971
Publication: Research › Conference abstract in proceedings – Annual report year: 2011

Quantifying the effect of natural microflora on growth of salmonellae in fresh pork

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute, University of Bonn
Authors: Birk, T. (Intern), Hansen, T. B. (Intern), Møller, C. (Intern), Ilg, Y. (Ekstern), Aabo, S. (Intern), Dalgaard, P. (Intern), Christensen, B. B. (Intern)
Survival and growth of exponential and stationary phase Salmonella during fermentation of sausage

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Müller, K. (Intern), Hansen, T. B. (Intern), Aabo, S. (Intern)
Publication date: 2011
Event: Poster session presented at 9th International Conference on the Epidemiology and Control of Biological Chemical and Physical Hazards in Pigs and Pork, Maastricht, Netherlands.
Main Research Area: Technical/natural sciences
Electronic versions:
Birk.pdf
Links:
http://www.safepork.org/
Source: orbit
Source-ID: 278027
Publication: Research › Poster – Annual report year: 2011

Effect of Organic Acids and Marination Ingredients on the Survival of Campylobacter jejuni on Meat

The aim of this study was to determine whether marination of chicken meat in different food ingredients can be used to reduce populations of Campylobacter jejuni strains, were exposed to different organic acids (tartaric, acetic, lactic, malic, and citric acids) and food marinating ingredients at 4 degrees C in broth and on chicken meat. The organic acids (0.5%) reduced populations of C. jejuni broth (chicken juice and brain heart infusion broth) by 4 to 6 log units (after 24 h): tartaric acid was the most efficient treatment. Large strain variation was observed among 14 C. jejuni isolates inoculated in brain heart infusion broth containing 0.3% tartaric acid. On chicken meat medallions, reductions of C. jejuni were 0.5 to 2 log units when tartaric acid solutions (2, 4, 6, and 10%) were spread onto the meal. Analysis of acidic food ingredient (e.g., vinegar, lemon juice, pomegranate syrup, and soya sauce) revealed that such ingredients reduced counts of C. jejuni by at least 0.8 log units on meat medallions. Three low pH marinades (pH <3) based oil pomegranate syrup. lemon juice, and white wine vinegar were prepared. When applied in whole filets, these marinades resulted in a reduction of approximately 1.2 log units after 3 days of storage. Taste evaluations of chicken meat that had been marinated and then fried were graded positively for flavor and texture. Thus, success was achieved in creating a marinade with an acceptable taste that reduced the counts of C. jejuni.
Growth of Salmonella in minced meat after freezing

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Hansen, T. B. (Intern), Aabo, S. (Intern)
Publication date: 2010
Event: Poster session presented at 22nd International ICFMH Symposium, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 272031
Publication: Research > Poster – Annual report year: 2010

Role of Dps protein in stress response of Campylobacter jejuni

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute, University of Copenhagen
Authors: Ligowska, M. (Ekstern), Cohn, M. T. (Ekstern), Birk, T. (Intern), Ingmer, H. (Ekstern), Brøndsted, L. (Ekstern)
Publication date: 2010
Event: Poster session presented at 22nd International ICFMH Symposium, Copenhagen, Denmark.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 272034
Publication: Research > Poster – Annual report year: 2010
Survival and growth of exponential and stationary phase Salmonella in meat juice after freezing

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Aabo, S. (Intern)
Publication date: 2010

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 263748

Survival and growth of exponential and stationary phase Salmonella in meat juice after freezing

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Hansen, T. B. (Intern), Aabo, S. (Intern)
Number of pages: 51
Publication date: 2010

Host publication information
Title of host publication: FMN - 8th Symposium on Food Microbiology
Publisher: LMC
Main Research Area: Technical/natural sciences
Conference: 8th Symposium on Food Microbiology, Helsingør, Denmark, 02/06/2010 - 02/06/2010
Source: orbit
Source-ID: 263742

Fate of food-associated bacteria in pork as affected by marinade, temperature, and ultrasound: Marinade and ultrasound effects on bacteria

General information
State: Published
Organisations: University of Copenhagen
Authors: Birk, T. (Intern), Knøchel, S. (Ekstern)
Pages: 549-555
Publication date: 2009
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Food Protection
Volume: 72
Issue number: 3
ISSN (Print): 0362-028X
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.68 SJR 0.759 SNIP 0.82
Web of Science (2016): Indexed yes
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.96 SNIP 1.031 CiteScore 2.03
Sensitivity of Campylobacter jejuni to different antimicrobial compounds using chicken skin/meat food model systems

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Nielsen, C. T. (Ekstern), Brøndsted, L. (Ekstern), Christensen, B. B. (Intern), Knøchel, S. (Ekstern), Rosenquist, H. (Intern)
Publication date: 2007
Event: Poster session presented at International conference on: Meat safety: from abattoir to consumer, Valencia, Spain, .
Sensitivity of Campylobacter jejuni to different antimicrobial compounds using chicken skin/meat food model systems

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Nielsen, C. T. (Ekstern), Brøndsted, L. (Ekstern), Christensen, B. B. (Intern), Knøchel, S. (Ekstern), Rosenquist, H. (Intern)
Publication date: 2007
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 237728
Publication: Research › Conference abstract for conference – Annual report year: 2007

The effect of marinating ingredients on the survival of Campylobacter jejuni on chicken meat

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Knøchel, S. (Ekstern), Christensen, B. B. (Intern), Rosenquist, H. (Intern)
Publication date: 2007
Event: Abstract from 14th International Workshop on Campylobacter, Helicobacter and Related Organisms, Rotterdam, Netherlands.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 237018
Publication: Research › Conference abstract for conference – Annual report year: 2007

The effect of marinating ingredients on the survival of Campylobacter jejuni on chicken meat

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Knøchel, S. (Ekstern), Christensen, B. B. (Intern), Rosenquist, H. (Intern)
Publication date: 2007
Event: Poster session presented at 14th International Workshop on Campylobacter, Helicobacter and Related Organisms, Rotterdam, Netherlands.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 237019
Publication: Research › Poster – Annual report year: 2007

A comparative study of two food model systems to test the survival of Campylobacter jejuni at -18 degrees C

The survival of Campylobacter jejuni NCTC 11168 was tested at freezing conditions (-18 degrees C) over a period of 32 days in two food models that simulated either (i) the chicken skin surface (skin model) or (ii) the chicken juice in and around a broiler carcass (liquid model). In the skin model, cells were suspended in chicken juice or brain heart infusion broth (BHIB) and added to 4-cm(2) skin pieces, which were subsequently stored at -18 degrees C. In the liquid model, cells were suspended in chicken juice or BHIB and stored at -18 degrees C. The decrease in the number of viable C. jejuni NCTC 11168 cells was slower when suspended in chicken juice than in BHIB. After freezing for 32 days, the reductions in the cell counts were 1.5 log CFU/ml in chicken juice and 3.5 log CFU/ml in BHIB. After the same time of freezing but when inoculated onto chicken skin, C. jejuni NCTC 11168 was reduced by 2.2 log units when inoculated in chicken juice and 3.2 log units when inoculated into BHIB. For both models, the major decrease occurred within the first 24 h of freezing. The results obtained in the liquid model with chicken juice were comparable to the reductions of Campylobacter observed for commercially processed chickens. The survival at -18 degrees C in the liquid model was also tested for three poultry isolates and three human clinical isolates of the serotypes 1.44, 2, and 4 complex. As observed for C. jejuni NCTC 11168, all the strains survived significantly better in chicken juice than in BHIB and were not notably influenced by serotype or origin. The findings indicate that the composition of the medium around the bacteria, rather than the chicken skin surface, is the major determining factor for the survival of C. jejuni at freezing conditions. The liquid model with chicken juice was therefore the best model system to study the freezing tolerance in Campylobacter strains.
Development of chicken skin/meat food model systems to determine the sensitivity of Campylobacter jejuni to different antimicrobial compounds

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Birk, T. (Intern), Nielsen, C. T. (Ekstern), Brøndsted, L. (Ekstern), Christensen, B. B. (Intern), Knøchel, S. (Ekstern), Rosenquist, H. (Intern)
Publication date: 2006
Event: Abstract from 4th Symposium on Food Microbiology, Helsingør, Denmark.
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 247989
Publication: Research › Conference abstract for conference – Annual report year: 2006

Ongoing Danish research activities on interventions to control Campylobacter

General information
State: Published
Organisations: Division of Microbiology and Risk Assessment, National Food Institute
Authors: Rosenquist, H. (Intern), Hansen, V. (Intern), Birk, T. (Intern), Bengtsson, A. (Intern), Christensen, B. B. (Intern)
Publication date: 2005
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 247815
Publication: Research › Conference abstract for conference – Annual report year: 2005

Chicken juice, a food-based model system suitable to study survival of Campylobacter jejuni

AIMS:
The purpose of this study was to develop a food-based model system that resembles the environment that Campylobacter jejuni experiences on raw poultry products and use this model system to investigate growth and survival of the bacterium.

METHODS AND RESULTS:
Chicken juice was collected from frozen chickens and subsequently cleared by centrifugation and subjected to sterile filtration. At low temperatures (5 and 10 degrees C) C. jejuni NCTC11168 remained viable in chicken juice for a remarkably longer period of time than in the reference medium BHI. When exposed to heat stress (48 degrees C) C. jejuni NCTC11168 also showed increased viability in chicken juice compared with the reference medium. Furthermore, agar plates made with chicken juice supported growth of four clinical isolates of C. jejuni and a C. jejuni strain obtained from chicken at both 37 and 42 degrees C.

CONCLUSIONS:
Our work shows that minimal processed and sterilized chicken juice is an ideal environment for survival of C. jejuni and that it is useful as a food-based model system.

SIGNIFICANCE AND IMPACT OF THE STUDY:
The developed model system may contribute to the understanding of C. jejuni viability on poultry products and can be
instrumental in the development of alternative preservation strategies.

**General information**
State: Published
Organisations: Royal Veterinary and Agricultural University
Authors: Birk, T. (Intern), Ingmer, H. (Ekstern), Jørgensen, K. (Ekstern), Brønsted, L. (Ekstern)
Pages: 66-71
Publication date: 2004
Main Research Area: Technical/natural sciences

**Publication information**
Journal: Letters in Applied Microbiology
Volume: 38
ISSN (Print): 0266-8254
Ratings:
BFI (2018): BFI-level 1
Web of Science (2018): Indexed yes
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 1.82
BFI (2015): BFI-level 1
Scopus rating (2015): CiteScore 1.66
Web of Science (2015): Indexed yes
BFI (2014): BFI-level 1
Scopus rating (2014): CiteScore 1.8
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): CiteScore 2.09
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): CiteScore 1.92
ISI indexed (2012): ISI indexed yes
Web of Science (2012): Indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): CiteScore 1.87
ISI indexed (2011): ISI indexed yes
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Web of Science (2010): Indexed yes
BFI (2009): BFI-level 1
Web of Science (2009): Indexed yes
BFI (2008): BFI-level 1
Web of Science (2008): Indexed yes
Web of Science (2007): Indexed yes
Web of Science (2006): Indexed yes
Web of Science (2005): Indexed yes
Web of Science (2004): Indexed yes
Web of Science (2003): Indexed yes
Web of Science (2002): Indexed yes
Web of Science (2001): Indexed yes
Web of Science (2000): Indexed yes
Original language: English
DOIs: 10.1046/j.1472-765X.2003.01446.x
Projects:

**Development of a birch sap with extended shelf life for prevention and treatment of birch pollen allergy**

The prevalence of allergic diseases is rising dramatically in both developed and developing countries, representing a major health problem and a burden to society. In particular, tree pollen allergies are estimated to affect approximately 40% of the population in the Northern Hemisphere, where birch pollen displays the greatest allergic potency. Moreover, 50-75% of birch pollen allergic patients also experience allergic symptoms upon consuming foods containing cross-reactive allergens. Current options to change the course of the disease and restore allergen-specific immune tolerance may be associated with adverse side effects. Therefore, innovative therapies to enhance the therapeutic efficacy and safety are needed. Across Scandinavia, many birch pollen allergy sufferers have reported mitigation of their symptoms after drinking birch sap. However, there is no scientific evidence supporting the use of birch sap as a treatment of pollen allergy. The aim of this project is to develop new commercially available birch sap products to induce tolerance in birch pollen allergic individuals. These products could be used as natural medicine/functional foods in the treatment of birch pollen allergy. To achieve this objective, we will:

1. Identify immune reactive allergens in birch sap and cross-reactive allergens in birch pollen and related foods.
2. Investigate the potential induction of oral tolerance to birch pollen by birch sap and consequently, the prophylactic efficacy against birch pollen allergy and cross-reactive food allergies.
3. The safety and efficacy of birch sap for the treatment of birch pollen allergy and related food allergies.

The outcome of this project could provide the foundation for developing new ways to treat millions of people worldwide suffering from birch pollen allergy in a safe and efficient manner.

National Food Institute
Research Group for Gut Microbiology and Immunology
Birkesaft.dk

**Infektionsevnen af Salmonella Typhimurium DT41 i rugægshøner og slagtekyllinger**

National Food Institute
Division of Food Microbiology

**Financing sources**
Source: Other public support (public)
Name of research programme: Fjerkræafgiftsfonden
Activities:

**10th International CDIO Conference**
Period: 15 Jun 2014 → 19 Jun 2014
Tina Birk (Participant)
National Food Institute
Division of Food Microbiology
Documents:
Collaboration between courses in the interdisciplinary course Food Microbiology

**Related event**

10th International CDIO Conference: Sharing successful engineering education experiences
15/06/2014 → 19/06/2014
Barcelona, Spain
Activity: Attending an event › Participating in or organising workshops, courses, seminars etc.

**Conceive Design Implement Operate (CDIO 2013)**
Period: 9 Jun 2013 → 13 Jun 2013
Tina Birk (Participant)
National Food Institute
Division of Food Microbiology

**Description**
CDIO Boston 2013.

**Related event**

Conceive Design Implement Operate (CDIO 2013): Engineering Leadership in Innovation and Design
09/06/2013 → 13/06/2013
Cambridge, MA, United States
Activity: Attending an event › Participating in or organising a conference

**8th Symposium on Food microbiology; 8**
Period: 3 Jun 2010
Tina Birk (Speaker)
National Food Institute
Division of Microbiology and Risk Assessment

**Description**
Place: LMC Foodmicro 2010, Helsingør, Denmark

**Related external organisation**

Unknown external organisation
Activity: Talks and presentations › Conference presentations