



Københavns Universitet

**Attachment behaviour of pathogenic bacteria on food and food contact surfaces in container transport**

Abban, Stephen; Jespersen, Lene

*Published in:*

22nd International ICFMH Symposium Food Micro 2010

*Publication date:*

2010

*Document Version*

Early version, also known as pre-print

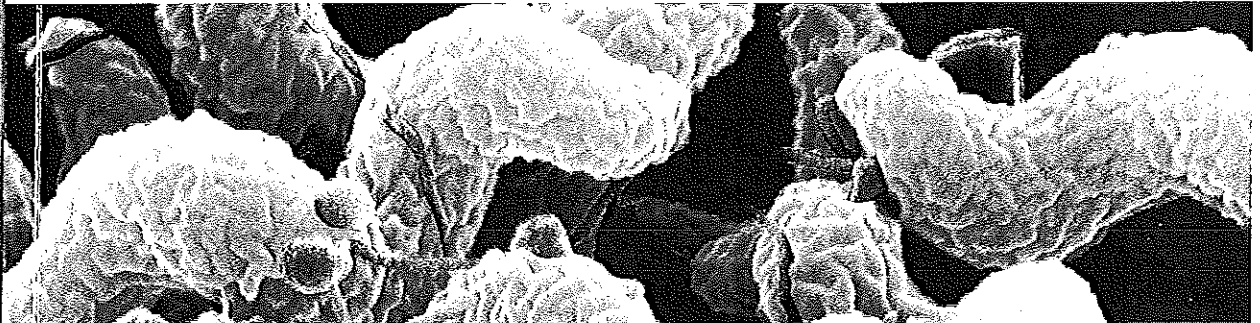
*Citation for published version (APA):*

Abban, S., & Jespersen, L. (2010). Attachment behaviour of pathogenic bacteria on food and food contact surfaces in container transport. In 22nd International ICFMH Symposium Food Micro 2010 Copenhagen.

# 22<sup>nd</sup> International ICFMH Symposium Food Micro 2010



Copenhagen 30<sup>th</sup> August - 3<sup>rd</sup> September



Final Programme & Abstract Book



[www.foodmicro.dk](http://www.foodmicro.dk)

## Author index

Abay S	PED2.60	Andreasen, AS	PSE1.03	Bahalul M	PEA1.66, PEA1.67	Bester Ingrid	
Abban S	PEA1.70	Andrews S	PEB2.19	Bak Christensen B	PED2.14	Bešvir V	F
Abban, Stephen	PSD1.03	Andritsos Nikolaos	PEC1.01, PEC1.72	Baila C	PED1.19, PED1.20	Beuchat Larry R.	F
Abbasadegan M	PEC2.45	Angelidis Apostolos	PEA1.60, PED2.51	Bang-Berthelsen I	PED1.03	Beumer R	F
Abdelgadir WS	PEA1.70	Anihouvi Victor Bienvenu	PEA1.38	Baranyi, J	PSC1.02, PSE2.04	Bianchi Daniela Man	F
Abee T	PEC1.29, PEB2.29, PSD2.02, PSB2.03	Anita F	PEA2.22	Barbaro A	PEB1.29	Bianchi DM	
Abee Tjikko	PEB2.09	Anslow P	PEB2.44	Barber A	PEE2.02	Biavati, B	
Abildgaard L	PEB1.30	Anyogu A	PEA2.18, PEC2.28	Barbosa Matheus de Souza	PED2.48	Bidot, D	
Adam Katharine	PEB2.02	Anyogu Amara	PEB2.39	Barbuti S	PEC1.76	Bigwood, T	
Adebayo CO	PED2.26, PED2.27	Aota T	PEB1.02	Bardowski J.	PEA1.46	Binter C	
Adelantado C	PEB1.25	Aponte M	PEA1.43	Baril Eugenie	PEB2.15	Birk T	
Adelantado Carles	PEE2.19	Aponte Maria	PEA1.75	Barile M	PED2.06	Birk Tina	
Aderiye Jadesola B	PED2.26, PED2.27	Aquilanti Lucia	PEA1.47	Barker G	PEC2.06, PEC2.11, PEC2.37	Bisotti S	I
Adimpong David B	PEA1.40	Arabshahi M	PEB1.27	Barmark G	PEC1.12	Bizzarri F	
Adolphe Ysabelle	PEC1.40, PEC1.41	Aranda Medina E	PEE2.06	Barrucci F	PEC2.40	Bjerrum Lotte	
Aertsen A	PEB2.66, PSB2.06	Arapaki S	PEB2.50	Barrucci Federica	PEC2.39	Björkroth KJ	
Aguilhon C	PEC1.22	Arbault Patrice	PEC1.80, PEB2.55	Bartolomeoli I	PEC1.34, PEB2.62, PEB2.63	Björkroth KJ	
Akabanda F	PEA1.36	Arcangeli G	PEC1.35	Basaglia M	PEA2.08	Blaiotta G	
Akabanda Fortune	PEA1.37	Arendt EK	PEA2.27	Bassami MR	PEC2.45	Blaiotta Giuseppe	I
Akbarien H	PEB1.27	Argyri Anthoula	PEC1.55	Bašsi D	PEC2.53	Blana V	I
Akissoe NH	PEA1.14	Argyri, A	PSD2.06	Bassi Daniela	PEA2.37	Blank L	
Alapont C	PEC2.19	Arinder P	PEC1.48	Batista Almeida e Silva J	PEA1.26	Bleicher A	
Alastrure A	PEC2.19	Arinberg Pernilla	PED2.29	Battilani A	PEC2.54	Blessington T	
Albert I	PEC2.49	Arneborg N	PEA1.41, PED2.16, PED2.39	Battilani A	PEA1.19	Blohmke C	
Alegria A.	PEA1.46	Arneborg Nils	PEA1.10	Bavan T	PEA1.19	Bodrossy L	
Alessandria V	PEA1.45, PEA1.65, PEC1.71, PSB1.05	Arosemena EL	PEB1.25	Baylis C	PED1.30	Body C	
Alessio G	PEA1.34	Arosemena EL	PEE2.19	Beal Catherine	PEA1.03	Boel Jeppe	
Alexandre, H	PSA2.01	Asakura M	PEC1.77, PEA2.38	Beck Hansen T	PED2.40	Bogicevic, Biljana	
Alftren J	PEE2.02	Atamer Zeynep	PEA1.16	Begum M	PEC1.56	Bolaños S	
Ali Y	PEA1.16	Atindehou MM	PEB1.24	Behera P	PEB1.17	Bolton Declan	
Allende A	PED2.42, PSD1.04	Aubert, X	PSD2.04	Belessi Charalambia-Irini	PEB2.50, PEC2.46	Bonetta S	I
Almeida E	PEA1.39, PEA1.58, PEA1.76	Audenaert W TM	PED1.25	Belfiore C	PEB2.42	Bonetta Silvia	I
Almeida MV	PEC1.13	Auvinen P	PEA2.28	Belk KE	PED1.27	Bonke R	
Alonso-Calleja C	PEB2.51	Avendano-Perez, Gaspar	PSE2.04	Belletti N	PEC1.32, PEC1.93, PED2.58	Bonnichsen L	
Alsady M	PED2.56	Axelsson L	PEB2.52	Bello OO	PEA2.34	Borch E	PEC1.48,
Al-Soud WA	PEE2.14, PSE1.03	Ayaz ND	PEB1.01	Beltran, D	PSD1.04	Bord C	
Álvarez JC	PED1.05	Aydin F	PED2.60	Beney L	PED2.34	Bordignon Stefano	
Álvarez-Ordóñez Aveino	PEB2.51, PEB2.52	Ayernor GS	PEA1.38	Beney Laurent	PED2.35	Bordin P	
Alves de Ávila AR	PED2.61	Aymerich T	PEA1.35, PEC1.32, PEC1.45, PED1.18, PED2.33	Benito Bernáldez MJ	PEA1.13	Bordoni, A	
Alvseike O.	PEB2.52	Aymerich Teresa	PEB2.40	Bensoussan M	PEC1.73, PEC1.74, PEC1.75	Borilova G	
Ambroziè M	PEC2.32	Azadnia Parisa	PEA1.02	Berkvens D	PEC1.30	Borkovcova I	
Amrouche, Tahar	PSA2.06	Azevedo A	PEC2.22	Bermúdez E	PEA2.38	Boseret G	
An BK	PEB2.10	Azimi-rad M	PEB1.27	Bernard M	PEC2.62	Botsaris George	
Anastasio A	PED2.06	Azokpota Paulin	PEA1.42	Bernardi M	PEC2.62	Bottari B	
Anastasiou R	PEA1.11	Baba-Moussa Lamine	PEB1.24	Bernardi T	PED2.47	Bottari Benedetta	
Ancelet-Enjalric Sophie	PEC2.49	Badirou EM	PEB1.24	Berndtsson B	PEB1.06	Botteldoorn N	I
Andersson G	PEC1.07, PEC2.37	Baert L	PEC2.48	Bernini V	PEA2.09, PEE2.09	Bouix M	
Andjelkovic M	PEC1.102, PSB1.04	Baert Leen	PEC2.15, PSC2.04	Bernini Valentina	PED2.18	Boumgha-Bourtcha	
Andrade MJ	PEA2.38	Baffone W	PEC1.101	Berstad A	PEC2.08	Bourke P	
Andre Stéphane	PEB2.12	Baffoni, Loredana	PSE1.04	Berthoud H	PEA1.19	Bouvier M	
		Baggesen DL	PEC1.100, PED1.23, PSE1.02	Berthoud, H	PSA1.03, PSC2.06	Bouw E	
				Bessell, P		Bouwknegt M	
						Bover-Cid S	I



PSD1.03

**Attachment behaviour of pathogenic bacteria on food and food contact surfaces in container transport***Stephen Abban (1), L Jespersen (1)**(1) Department of Food Science, Faculty of Life Sciences, University of Copenhagen, Denmark*

Transportation is one link in the food chain that is often overlooked with regards to cross contamination and safety, even in risk models. Coupled to this is the very low amount of information in this link of the food chain with regards to cross contamination. However, foreseeable scenarios show that this could be an important source of food contamination. Such scenarios include the smearing of container linings during food cargo loading and unloading, as well as dripping of condensates in containers with poorly regulated internal temperatures. The aim of this ongoing research is to understand the behaviour of pathogenic bacteria on different food contact construction materials as well as selected foods. In the present study 1cm<sup>2</sup> chips of 3 surfaces- aluminium, stainless steel and a re-enforced polymer are coated with suspensions of *Escherichia coli* K12 in the presence of chicken extracts or Luria-Bertani broth to mimic smearing. The surfaces have also been coated with buffered suspension of bacteria for 5, 10, 15 and 30 minutes to explore the time needed for maximal initial attachment. The surfaces have been characterized by  $R_a$  and  $R_z$  measurements. Apples were also coated with bacteria both in the presence and absence of chicken extract. Different cleaning set-ups mimicking processes typical for containers have been established to study the ease of detachment of the bacteria. Residual bacteria on the material surfaces are assessed by fluorescence microscopy using acridine orange stain followed by image analysis, and by plating and colony counting. Initial result trends show that the presence of food residue of animal origin has the effect of reducing the attachment ability of bacteria to the abiotic surfaces tested. The presence of chicken residue also caused about a log unit less attachment to the apple surfaces compared to bacteria in water. However bacteria that attach to and dry on surfaces with extracts were more difficult to detach compared to those attached without the extract. Adherence of bacteria cells and cleanability was related to the  $R_a$  and  $R_z$  of the surfaces. These initial trends show that the behaviour of bacteria on food and food contact surfaces during transport can be very complex and more research is needed in this link in the food chain to allow more accurate modelling.

**PSD1.04 Irrigation quantity and timing impact microbial risk of fresh-cut lettuce***A Allende (1), F López-Gálvez (1), M Moreno-Candel (1), D Beltran (1), A Martínez-Sánchez (1), JA Tudela (1),**Maria I Gil (1)**(1) CEBAS-CSIC, Spain*

An unequivocal consequence associated to climate change is global warming. Among other climate effects, global warming can be also associated with extended dry periods. In fact, climate change is exacerbating water scarcity problems, which is an increasingly frequent phenomenon in the south of Europe, where most crop production of leafy greens takes place. Water scarcity is likely to reduce the water availability for irrigation in dry areas, which might have an impact on the microflora of vegetable products such as leafy greens. Additionally, the use of an excess irrigation quantity has been related to an increased in yield production. However, this might also have an impact on the quality and safety of leafy greens as it has been hypothesized that an increase of water availability increases the microbial population in plant due to a moisture accumulation on the leaves surfaces. In the present study we have evaluated the impact on the physiology and microbiological quality of deficit (-50% and -25%) and excess (+50% and +25%) of irrigation quantities during Iceberg and Romaine lettuce production as well as the irrigation termination at T1, T3 and T5, which refers to the days (1, 3 and 5) of the last irrigation before harvest. Additionally, the potential infiltration of *Salmonella enterica* serovar *Typhimurium* in the stress tissue during washing was also evaluated. The obtained results showed a reduction of about 25% and 50% of the irrigation quantities regularly applied to Romaine lettuce during cultivation reduced the microbial load, including total coliforms when compared to excess water irrigation. However, variation in the irrigation termination seemed not to have an effect on the natural microflora. These preliminary results show the intrinsic vulnerability of the fresh produce chain to potential emerging microbial hazards associated with climate change. Thus, the risk evaluation of newly identified threats associated with the anticipated climate change is very important to determine risk management strategies.