Characterization of the microflora of lightly salted lumpfish (Cyclopterus lumpus) roe stored at 5°C

Numeric taxonomy analysis of 70 lactic acid bacteria (LAB) and 30 Enterobacteriaceae from lightly salted lumpfish roe, showed that Enterobacteriaceae formed three subgroups: Morganella morganii presumptive Serratia liquefaciens and Serratia plymuthica. LAB formed three subgroups of presumptive Lactococcus spp. and Carnobacterium spp. Production of off-odors and volatile sulfur compounds by twelve selected strains and three Vibrio spp. of identical origin in pasteurized roe, and of three Enterobacteriaceae in sterile fresh roe, was examined. Morganella morganii produced off-odors and volatile sulfur compounds in both pasteurized and fresh roe. One Serratia liquefaciens produced strong off-odors but no volatile sulfur compounds in fresh roe.

General information
State: Published
Organisations: National Institute of Aquatic Resources
Authors: Basby, M. (Intern), Jeppesen, V. (Ekstern), Huss, H. H. (Intern)
Pages: 35-51
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Aquatic Food Product Technology
Volume: 7
Issue number: 4
ISSN (Print): 1049-8850
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.59 SJR 0.268 SNIP 0.582
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.298 SNIP 0.623 CiteScore 0.65
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.275 SNIP 0.632 CiteScore 0.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Scopus rating (2013): SJR 0.281 SNIP 0.558 CiteScore 0.59
ISI indexed (2013): ISI indexed yes
Web of Science (2013): Indexed yes
BFI (2012): BFI-level 1
Scopus rating (2012): SJR 0.429 SNIP 0.545 CiteScore 0.64
ISI indexed (2012): ISI indexed yes
BFI (2011): BFI-level 1
Scopus rating (2011): SJR 0.385 SNIP 0.621 CiteScore 0.68
ISI indexed (2011): ISI indexed no
Web of Science (2011): Indexed yes
BFI (2010): BFI-level 1
Scopus rating (2010): SJR 0.282 SNIP 0.34
Web of Science (2010): Indexed yes
Chemical composition of fresh and salted lumpfish (Cyclopterus lumpus) roe

General information
State: Published
Organisations: National Institute of Aquatic Resources
Authors: Basby, M. (Intern), Jeppesen, V. (Ekstern), Huss, H. H. (Intern)
Pages: 7-21
Publication date: 1998
Main Research Area: Technical/natural sciences

Publication information
Journal: Journal of Aquatic Food Product Technology
Volume: 7
Issue number: 4
ISSN (Print): 1049-8850
Ratings:
BFI (2018): BFI-level 1
BFI (2017): BFI-level 1
Web of Science (2017): Indexed Yes
BFI (2016): BFI-level 1
Scopus rating (2016): CiteScore 0.59 SJR 0.268 SNIP 0.582
BFI (2015): BFI-level 1
Scopus rating (2015): SJR 0.298 SNIP 0.623 CiteScore 0.65
BFI (2014): BFI-level 1
Scopus rating (2014): SJR 0.275 SNIP 0.632 CiteScore 0.62
Web of Science (2014): Indexed yes
BFI (2013): BFI-level 1
Spoilage of lightly salted lumpfish (Cyclopterus lumpus) roe at 5°C

Lightly salted lumpfish roe (3.5–4.8% fw/w] salt in the water-phase, pH 5.4, vacuum-packed) was stored at 5°C. After 2 1/2 or 3 months of storage, different degrees of spoilage, caused by bacterial activity, occurred in eleven roe batches. Off-odors ranged from no or very weak odors to strong sulphury, sour odors. The microflora consisted of lactic acid bacteria, Enterobacteriaceae and Vibrio spp. Concentration of lactic acid, acetic acid, trimethylamine and total volatile bases were unrelated to spoilage odors. Volatile sulfur compounds (H2S, probably CS2, CH3SH and CH3CH2SH or CH3SCH3), produced during storage, appeared to be contributors to spoilage odors.

General information
State: Published
Organisations: National Institute of Aquatic Resources
Authors: Basby, M. (Intern), Jeppesen, V. (Ekstern), Huss, H. H. (Intern)
Pages: 23-34
Publication date: 1998
Main Research Area: Technical/natural sciences
Lightly salted lumpfish roe, Microbiology, Spoilage indicators, Off-odors, Volatile sulfur compounds

DOI: 10.1300/J030v07n04_04
Lightly salted lumpfish roe: Composition, spoilage, safety and preservation

General information
State: Published
Organisations: National Institute of Aquatic Resources
Authors: Basby, M. (Intern)
Number of pages: 203
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences

Bibliographical note
DFU-rapport 46-97

Source: orbit
Source-ID: 224863
Publication: Research › Ph.D. thesis – Annual report year: 1997

Lightly salted lumpfish roe. Composition, spoilage, safety, and reservation

General information
State: Published
Organisations: National Institute of Aquatic Resources
Authors: Basby, M. (Intern)
Number of pages: 203
Publication date: 1997

Publication information
Original language: English
Main Research Area: Technical/natural sciences
Source: orbit
Source-ID: 167641
Publication: Research › Book – Annual report year: 1997

Projects:

Lightly salted lumpfish roe. Composition, spoilage, safety and preservation

Traditional caviar products are often heavily salted and further preserved by addition of chemical preservatives. This industrial Ph.D. project has studied the problems associated with reducing the salt content and eliminating the chemical preservatives from the product. It was shown that Lactic Acid Bacteria (LAB) dominated the microbial flora after three months of storage at plus 5°C of this lightly salted product (approx. 4% water phase salt (WPS)), but also Enterobacteriaceae was found in high numbers, particularly when WPS was lower than 4%. A number of chemical indicators of spoilage were analysed, but only volatile sulphur compounds were related to sensory spoilage. The presence and growth of Listeria monocytogenes was identified as a possible health hazard. Experiments with biopreservation were unsuccessful, but the use of 2.8% (w/w) sodium lactate was found to be a possible alternative.

National Institute of Aquatic Resources
Abba Seafood A/S
Period: 01/10/1994 → 31/07/1997
Number of participants: 2
Project participant:
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Project Manager, organisational:
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Project
