Microbiological Quality of Powdered Infant Formula in Latin America

Por: Parra-Flores, J (Parra-Flores, Julio)[1]; Maury-Sintjago, E (Maury-Sintjago, Eduard)[1]; Rodriguez-Fernandez, A (Rodriguez-Fernandez, Alejandra)[1]; Acuna, S (Acuna, Sergio)[2]; Cerda, F (Cerda, Fabiola)[2]; Aguirre, J (Aguirre, Juan)[3]; Holy, O (Holy, Ondrej)[4]
Ver número de ResearcherID y ORCID de Web of Science

JOURNAL OF FOOD PROTECTION
Volumen: 83
Número: 3
Páginas: 534-541
DOI: 10.4315/0362-028X.JFP-19-399
Fecha de publicación: MAR 2020
Tipo de documento: Article
Ver impacto de la revista

Abstract

Cronobacter is a bacterial genus that includes seven species, and the species Cronobacter sakazakii is most related to meningitis and septicemia in infants associated with powdered infant formula (PIF). The objectives of this study were to evaluate the presence of C. sakazakii and to determine the microbiological quality of PIF for infant consumption. To do this, a total of 128 PIF samples were analyzed in four brands and countries (Chile, Mexico, Holland, and Brazil), considering three types of PIF: premature (PIF1), infant (PIF2), and follow-up (PIF3). Aerobic plate counts (APC) and Enterobacteriaceae (ENT) were assessed in accordance with Chilean official standards. The outer membrane protein A (ompA) gene was amplified to detect Cronobacter spp. and the fusA gene was amplified to identify C. sakazakii by using the PubMLST Web site and BLAST (NCBI). The antibiotic resistance profile was performed according to the Clinical and Laboratory Standards Institute standards. The pathogen was quantified by the most probable number (MPN). The results showed that APC median values for PIF1, PIF2, and PIF3 were 3.2, 4.9, and 4.8 log CFU g(-1), respectively. The APC were higher in PIF2 ($P < 0.01$) from Holland ($P < 0.01$) in the commercial brand 4 ($P < 0.01$). The ENT median values in PIF1, PIF2, and PIF3 were 1.8, 1.5, and 1.7 log CFU g(-1), respectively. Five strains of C. sakazakii and one strain of Cronobacter malonaticus were identified as having values between 0.023 and 2.3 MPN/g. All strains (100%) harbored the ompA, plasminogen activator (cpa), and hemolysin (hly) virulence genes. To conclude, C. sakazakii was found in four PIF samples from four Chilean products and one from Mexico, which is distributed throughout America. C. sakazakii strains exhibit virulence factors and resistance to ampicillin, thus posing a risk when PIFs are consumed by infants.

Palabras clave

Palabras clave de autor: Antibiotic resistance; Cronobacter sakazakii; Microbiological quality; Powdered infant formula; Virulence

KeyWords Plus:CRONOBACTER-SAKAZAKII; ENTEROBACTER-SAKAZAKII; ANTIBIOTIC SUSCEPTIBILITY; NEONATAL MENINGITIS; HEMOLYSIN-III; SPP.; VIRULENCE; FOODS; GENUS; MILK

Información del autor

Dirección correspondiente: Parra-Flores, J (corresponding author)

+ Univ Bio Bio, Dept Nutr & Publ Hlth, Ave Andres Bello 720, Chillan 3800708, Chile.

Direcciones:

+ [1] Univ Bio Bio, Dept Nutr & Publ Hlth, Ave Andres Bello 720, Chillan 3800708, Chile
+ [2] Univ Bio Bio, Dept Food Engn, Ave Andres Bello 720, Chillan 3800708, Chile
+ [3] Univ Chile, Dept Agr Ind & Enol, Ave Santa Rosa 11315, Santiago 8820000, Chile
+ [4] Palacky Univ Olomouc, Fac Med & Dent, Dept Publ Hlth, Olomouc 77515, Czech Republic

Direcciones de correo electrónico:juparra@ubiobio.cl

Financiación

Entidad financiadora	Número de concesión
Research Directorate of the Universidad del Bio-Bio	191520 4
Research Directorate of the Universidad del Bio-Bio (Regular and Grupo de Investigacion)	171220
Research Directorate of the Universidad del Bio-Bio (En Formacion)	
Research Directorate of the Universidad del Bio-Bio (Comision Nacional de Investigacion Cientifica y Tecnologica/Fondo de Financiamiento de Investigacion en Areas Prioritarias [CONICYT/FONDAP])	15130015

Ver texto de financiación

Editorial

INT ASSOC FOOD PROTECTION, 6200 AURORA AVE SUITE 200W, DES MOINES, IA 50322-2863 USA

Información de la revista

- **Impact Factor:** Journal Citation Reports

Categorías / Clasificación

Áreas de investigación: Biotechnology & Applied Microbiology; Food Science & Technology
Categorías de Web of Science: Biotechnology & Applied Microbiology; Food Science & Technology

Información del documento

Idioma: English
Número de acceso: WOS:000539541800019
ID de PubMed: 32078682
ISSN: 0362-028X
eISSN: 1944-9097