

137 - VERIFICATION OF THE PRESENCE OF MICROBIAL FLORA IN PLASTIC TUBES OF MAYONNAISE, MUSTARD AND KETCHUP IN FIXED ESTABLISHMENTS OR STREET IN SÃO PAULO CITY (SP), 2014-2015

EZEQUIEL ANDRÉ DO NASCIMENTO;
RENATA SOUZA COELHO;
SANDRA MARIA SPILBORHS SÁ PINTO;
TAIS SANTOS NOVAIS SORAYA GARCIA AUDI
Instituto de Pesquisa e Estudos em Saúde - IPESSP, São Paulo, S.P., Brasil
sandraspilborghs@ig.com.br

doi:10.16887/86.a1.137

INTRODUCTION

Feeding outside the home has become a must for thousands of people around the world, for study, work or both on the same day, it makes lunch and dinner in the quiet of the home, in most cases, impossible, requiring that establishments that sell food, do so within quality standards, including the hygiene of the place, staff and utensils (ALVES; UENO, 2010; UNGKU FATIMAH et al., 2011; GORMLEY; RAWAL; LITTLE, 2011; SNEED; STROHNEHN, 2008; STANGARLM; DELEVATI; SACCOL, 2008).

Despite the implementation of rules and laws governing hygiene and food safety, food borne, illnesses are increasingly present and grow exponentially throughout the world, at rates above 50%, through the handlers of food or products ready for use, sanitized improperly (LYNCH et al., 2006; Rosaria, 2010; AFIFI; ABUSHELAIBI, 2012).

Groups packaging used for packaging food comprising a composite glass, paper and/or cardboard, metal and plastic. The evolution of technology also provides the market with the combination of materials constituting the known multilayer packaging (PAINE & PAINE, 1992; HERNANDEZ et al., 2000; SARANTOPÓULOS et al., 2001; MESTRINER, 2002).

Technological developments in the plastics industry has been responsible for major advances in food marketing, bringing a number of benefits to modern society, as well as providing products, generates millions of jobs and income for the country (FABRIS; FREIRE e REYES, 2006), replacing traditional materials such as glass, metal and natural fibers such as reduction in obtaining and production costs, greater flexibility, diversity of materials, aseptic, shapes, structures and barriers (PAINE & PAINE, 1992; HERNANDEZ et al., 2000), which is the ability of a package to resist absorption or evaporation gases and vapors and resist the permeation of lipids and the passage of light (PAINE & PAINE, 1992; HERNANDEZ et al., 2000).

In physio-chemical terms, of plastic containers, especially mustard sauce tubes, mayonnaise and ketchup, are exposed to ambient temperature, light and oxygen, that they are sensitive to oxidation and high temperatures, exhibit permeability to gases, water vapor and aromas, possibility of occurrence material for the food, causing changes in taste/aroma and texture is lost, especially in the mayonnaise (FABRIS, FREIRE & REYES, 2006).

This factor is directly linked to the use of tubes in establishments that sell food, whether fixed or street where the mayonnaise tubes, ketchup and mustard are still widely used for this type of trade, kept at room temperature, the higher the preparation of exposure time in hazardous area, which is located at temperatures between 10°C and 60°C, pathogenic bacteria produce toxins and other microorganisms can multiply at a high speed. Thus, certain cold preparations, such as mayonnaise, sausages and some basic cold preparations and dairy products become hazardous in the absence of tight temperature control (ABERC – ASSOCIAÇÃO BRASILEIRAS DAS EMPRESAS DE REFEIÇÕES COLETIVAS, 2011).

The homemade mayonnaise has been associated with outbreaks of disease food borne as Salmonella, Staphylococcus aureus, Bacillus, Campylobacter and other triggering research on the control of microorganisms in mayonnaise (XIONG et al., 2002; MAIA, SOUZA E FURTADO, 2010), and research by Lucca and Torres (2002) showed that the frequency of cleaning of repeated use dispensers (tubes) of ketchup, mustard and mayonnaise was very low, showing poor appearance, and the pH of the contents of mayonnaise dressings (4.1), mustard ((3.95), ketchup (3,85), vinaigrette (3.9) and mashed potatoes (5,26), which is pH above 4.5, a value considered of risk.

According to Resolution SS-142, of 05.03.93, is sealed using plastic tubes or any other material containing mustard, ketchup and mayonnaise, but offered in packet, since the expiration date has to be printed on the packaging endorsed by RDC nº 259, of September 20, 2002 if gives ANVISA, determines that the packaged foods have the deadline printed in the form day/month/year for products up to 3 months in duration, and as month/year for the other products. Furthermore, the manufacturer shall inform the duration of the foods that can change after you open your packaging.

The use tubes doesn't provide food security for the consumer, where the danger is food poisoning because they favor the contamination food due to the collective handling, in which the consumer can pull the nozzle of the tube in snack or salty bitten containing bacteria that normally we have in the mouth.

MATERIALS AND METHODS

It was an observational epidemiological, descriptive, cross-sectional, quantitative and qualitative approach, consisting of fixed outlets and street vendors, who sell food and use plastic tubes for mustard, mayonnaise and ketchup, provided they are on display on tables or counters, in the southern, western, central, east and north of São Paulo city (SP).

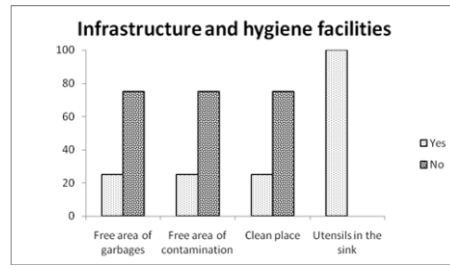
Samples were collected from tube to sauces (mayonnaise, mustard and ketchup) using swabs, past the nozzle of the tubes and putting in support, properly transported in cool boxes for the Institute of Research and Studies in Health São Paulo (IPESSP), to perform in ready culture Petri dish containing Chocolate Agar, Blood Agar, MacConkey Agar, Sabouraud Dextrose Agar, in the temperature of 37°C, divided into 4 parts. It was also made a check list, based on the model of Resolution nº275 (Brazil, 2002), Resolution nº216 (Brazil, 2004) and Portal nº 326 (Brazil, 1997).

OBJECTIVES

Determine the presence of microbial flora in plastic tubes containing mayonnaise, mustard and ketchup, in fixed establishments or street in São Paulo city, and observe the hygiene of the place and food handlers.

RESULTS

Graph 1: Distribution percentages with regard to infrastructure and installations of fixed establishments or street in São Paulo city, (SP). 2015



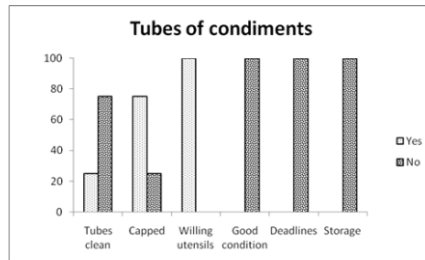
Comment: Graph 1 shows that 75% of the area isn't free from the accumulation of garbage, sewage, animals, insects and other pests, and isn't free from the presence of automated vehicles. It also notes that the site was not in perfect adequacy of cleaning and had to wash utensils in the sink.

Graph 2: Distribution percentages with respect to the handling of utensils and clothing of staff in fixed establishments or street in São Paulo city, S.P. 2015.



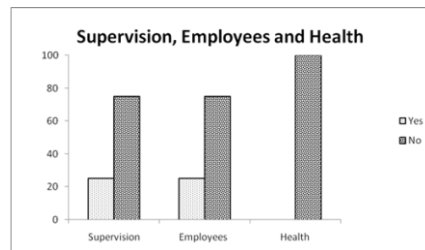
Comment: Graph 2 shows that 75% of wastes aren't in appropriate bags, employees don't wear full uniform and clean. 100% of employees had use of inappropriate adornments.

Graph 3: Distribution percentages regarding the tubes of condiments fixed establishments or street of the São Paulo city, S.P. 2015.



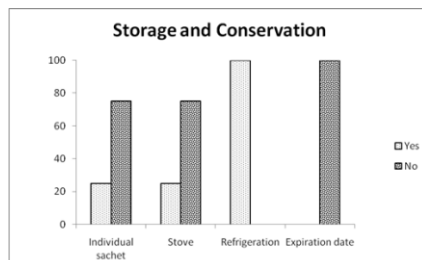
Comment: Graph 3 it can be seen that 75% of condiments tubes were not cleaned, but they were with lids. 100% of the utensils were willing to environment were not in good condition, didn't have expiry dates and/or manufacture and were not stored properly.

Graph 4: Distribution percentages with respect to supervision, number of employees in fixed establishments or street of the São Paulo city, S.P. 2015.



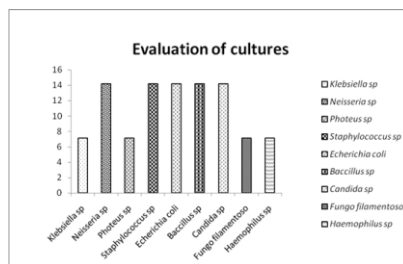
Comment: Graph 4 shows that 75% had no supervisory personnel hygiene. Establishments not had at least 3 employees and 100% didn't have cleaning and/or signs of waste in employees.

Graph 5: Distribution percentages with respect to storage and conservation in fixed establishments or street of the São Paulo city, S.P. 2015.



Comment: Graph 5 shows that only 25% of the establishments had individual sachets of condiments and food were kept properly. 100% of the foods that require refrigeration were in perfect adequacy of storage and food had no expiration date.

Graph 6: Distribution percentages regarding the evaluation of bacteria cultures in fixed establishments or street in São Paulo city, S.P. 2015.



CONCLUSION:

The results obtained, it was observed that there is the presence of microbial flora in the tubes of the establishments surveyed, leading to compromised food security, and leading to infectious manifestations. As regards the hygiene of the place and handlers, both were inadequate, contradicting the standards set by ANVISA and the States and Municipalities.

REFERENCES

- AFIFI, H. S.; ABUSHELAIBI, A. A. Assessment of personal hygiene knowledge, and practices in Al Ain, United Arab Emirates. *Food Control*, v. 25, n. 1, p. 249-253, 2012. <http://dx.doi.org/10.1016/j.foodcont.2011.10.040>.
- ALVES, M. G.; UENO, M. Restaurantes self-service: segurança e qualidade sanitária dos alimentos servidos. *Rev Nutr.*, v. 23, n. 4, p. 573-580, jul./ago. 2010.
- ASSOCIAÇÃO BRASILEIRA DAS EMPRESAS DE REFEIÇÕES COLETIVAS - ABERC. História, objetivos e mercado. Disponível em: <<http://www.aberc.com.br>>. Acesso em: 20 fev. 2015.
- BRASIL, 1997. Portaria SVS/MS nº 326, de 30 de julho de 1997. Estabelece a necessidade do constante aperfeiçoamento das ações de controle sanitário na área de alimentos, visando a proteção da saúde da população. D.O.U. de 01/08/1997.
- BRASIL, 2002. Resolução RDC nº 275, de 21 de outubro de 2002. Dispõe sobre o Regulamento Técnico de Procedimentos Operacionais Padronizados aplicados aos Estabelecimentos Produtores/Industrializadores de Alimentos e a Lista de Verificação das Boas Práticas de Fabricação em Estabelecimentos Produtores/Industrializadores de Alimentos. D.O.U. de 21/10/2002.
- BRASIL, 2004. Resolução RDC nº 216, de 15 de setembro de 2004. Dispõe sobre o Regulamento Técnico de Boas Práticas para Serviços de Alimentação. D.O.U. de 16/09/2004
- Brasil. Resolução RDC Nº 259, DE 20 DE SETEMBRO DE 2002. Aprovar o Regulamento Técnico sobre Rotulagem de Alimentos Embalados. São Paulo, 2002.
- BRASIL. Resolução SS-142, de 03 de maio de 1993. Norma Técnica relativa ao Comércio Ambulante de Gêneros Alimentícios. São Paulo, Maio de 1993.
- FABRIS, S; FREIRE, M.T.de A.; REYES, F.G.R. Embalagens plásticas: tipos de materiais, contaminação de alimentos e aspectos de legislação. *Revista Brasileira de Toxicologia* 19, n.2 (2006) 59-70
- Franco CR, Ueno M. Comércio Ambulante de Alimentos: Condições Higiênico-Sanitárias nos Pontos de Venda em Taubaté – SP. *UNOPAR Científica Ciência Biológica Saúde* V.12, n.4, p. 9-13, 2010.
- Franco, Bernadette D. G; Landgraf, Mariza. *Microbiologia dos Alimentos*. Atheneu, 2013.
- GORMLEY, F. J.; RAWAL, N.; LITTLE, C. L. Choose your menu wisely: cuisine-associated food-poisoning risks in restaurants in England and Wales. *Epidemiol Infect.*, v. 140, n. 6, p. 1-11, 2011. PMID:21854669. <http://dx.doi.org/10.1017/S0950268811001567>.
- HERNANDEZ, R., J.; SELKE, S., E.; M. CULTER, J., D. - *Plastics packaging - properties, processing, applications and regulations*. Munich: Hanser, 2000. 425p.
- LUCCA, A. e TORRES, E.A.F.S. Condições de higiene de “cachorro-quente” comercializado em vias públicas. *Rev Saúde Pública*, 2002;36(3):350-2. São Paulo.
- LYNCH, M.; PAINTER, J.; WOODRUFF, R.; BRADEN, C. Surveillance for foodborne disease outbreaks - United States, 1998-2002. *MMWR Surveill Summ.*, v. 55, n. 10, p. 1-46, 2006.
- MAIA, A.G.; SOUZA, M.L.de; FURTADO, C. M. Avaliação microbiológica de maionese produzidas e consumidas em lanchonetes e lanches ambulantes. *Cienc Tecnol Aliment.*, Campinas, 31(Supl.1): 121-130, JUN, 2010
- MESTRINER, F. - *Design de Embalagem*. Curso avançado. São Paulo: Pearson Education do Brasil, 2002. 138p.
- PAINE, F.A. & PAINE H.Y. - *A Handbook of food packaging*, Glasgow, UK, 1992. 497p.
- SARANTÓPOULOS, C.I.G.L.; OLIVEIRA, L.M.; CANAVESI, E. Requisitos de conservação de alimentos em embalagens flexíveis, Campinas: CETEA/ITAL, 2001. 213p.
- SNEED, J.; STROHNEHN, C. H. Trends impacting food safety in retail foodservice: Implications for dietetics practice. *J Am Diet Assoc.*, v. 108, n. 7, p. 1170-1177, 2008. PMID:18589025. <http://dx.doi.org/10.1016/j.jada.2008.04.009>
- Soares, Celina Mara; Valadares, Geórgio Freesz; Azeredo, Raquel M. Cordeiro; Kuaye, Arnaldo Yoshiteru. Contaminação ambiental e perfil toxigênico de *Bacillus cereus* isolados em serviços de alimentação. *Cienc. Rural*. V.38 n.2 Santa Maria mar./abr.2008.
- STANGARLM, L.; DELEVATI, M. T. S.; SACCOL, A. L. F. Vigência da RDC 216/04 para serviços de alimentação do centro de Santa Maria, RS (1ª Parte). *Hig Alim*, v. 22, n. 166-167, p. 20-23, 2008.
- UNGKU FATIMAH, U. Z. A., BOO, H. C., SAMBASIVAN, M.; SALLEH, R. Foodservice hygiene factors - the consumer perspective. *Int J Hosp Manag.*, v. 30, n. 1, p. 38-45, 2011. <http://dx.doi.org/10.1016/j.ijhm.2010.04.001>.
- XIONG, R.; XIE, G.; EDMONDSON, A. S.; MEULLENET, J-F. Neural network modeling of the fate of *Salmonella enterica* serovar Enteritidis PT4 in home-made mayonnaise prepared with citric acid. *Food Control*, 13 p. 525-533, 2002.

VERIFICATION OF THE PRESENCE OF MICROBIAL FLORA IN PLASTIC TUBES OF MAYONNAISE, MUSTARD AND KETCHUP IN FIXED ESTABLISHMENTS OR STREET IN SÃO PAULO CITY (SP), 2014-2015

ABSTRACT

Introduction: The development of society leads to changes in lifestyles, with strong changes in consumer eating habits, stimulating the development of packaging technology and achieving a considerable increase in food supply previously prepared, at where, conditions of time and temperature of contact between the product and packaging, are also critical for determining the potential risk of contamination. **Objective:** Determine the presence of microbial flora in plastic tubes containing mayonnaise, mustard and ketchup, in fixed establishments or street in São Paulo city, and observe the hygiene of the place and food handlers. **Methodology:** The microbiological analysis was based on Resolution RDC 12, ANVISA, 01/02/2001, using swabs that were passed in the nozzle tubes for sauces (mayonnaise, mustard and ketchup) and placed in support properly identified and transported in cool boxes for the research Institute and Studies on Health São Paulo (IPESP), for the realization of culture in ready plates, containing Chocolate Agar, Blood Agar, MacConkey Agar, Sabouraud Dextrose Agar, in the temperature of 37°C. To assist in the study, it was made a check list, for verification of good hygiene practices, in accordance with Resolution n°275, Resolution °216 and Portal n° 326. **Results:** Observed that, among the samples taken from tubes of ketchup, mustard and mayonnaise, the swab method, gave 34% positive, the individual analysis of tubes, obtained the positivity of 18% ketchup, 4% mustard and 12% mayonnaise. **Conclusion:** The results obtained, it was observed that there is the presence of microbial flora in the tubes of the establishments surveyed, leading to compromised food security, and leading to infectious manifestations. As regards the hygiene of the place and handlers, both were inadequate, contradicting the standards set by ANVISA and the States and Municipalities.

KEYWORDS: Food microbiology, plastic tubes, legislation, food safety, snacks to sauces.

VÉRIFIER LA PRÉSENCE DE FLORE MICRIBIEN DANS DES VISNAGE PLASTIQUE DE MAYONNAISE, MOUTARDE ET DE KETCHUP DANS ÉTABLISSEMENTS FIXES OU COLPORTAGE DANS LA VILLE DE SAO PAULO (SP), 2014-15.

RÉSUMÉ

Introduction: Le développement de la société conduit à des changements dans le style avec de forts changements dans les habitudes alimentaires des consommateurs, stimulant l'évolution de la technologie l'emballage et la promotion d'une augmentation considérable de l'approvisionnement en aliments pré-préparés, où les conditions météo et la température de contact entre le produit et l'emballage sont également critique pour la détermination du risque potentiel de contamination. **Objectifs:** Déterminer la présence de la flore microbienne dans des visnage plastique contenant de la mayonnaise, la moutarde et le ketchup, ainsi que, d'hygiène et manipulateurs locale. **Méthodologie:** L'analyse microbiologique a été basée sur la RDC 12 ANVISA, du 02/01/2001, en utilisant "de swab's" qui ont été adoptées dans les visnage de buse pour les sauces (mayonnaise, la moutarde et le ketchup) et placé à l'appui, correctement identifiés et transportés dans des glacières pour l'Institut de Recherches et D'études dans Santé de São Paulo (IPESP) pour effectuer la culture de plats cuisinés contenant Agar chocolat, Blood Agar, Agar MacConkey, Agar Sabouraud Dextrose, la température de 37 ° C Pour l'aider dans l'étude, a concocté une liste de contrôle pour la vérification des bonnes pratiques d'hygiène.. **Résultats:** On a observé que parmi les échantillons prélevés sur des visnage de ketchup, la moutarde et la mayonnaise, la méthode de swab, ont donné 34% positifs, l'analyse individuelle des tubes, nous avons obtenu un 18% ketchup positif, 4% de la moutarde à 12% mayonnaise. **Conclusion:** il y avait une croissance microbienne dans les échantillons, ce qui peut compromettre la sécurité alimentaire. Déjà l'hygiène des établissements et les gestionnaires étaient inadéquates, cotrariando la législation actuelle

MOTS-CLÉS: Microbiologie des aliments, des visnages en plastique, la législation sur les aliments, la sécurité alimentaire, des collations aux sauces.

AVERIGUACIÓN DE LA PRESENCIA DE LA FLORA MICROBIANA EN LAS BIZNAGAS PLÁSTICAS DE MAYONESA, MOSTAZA Y KÉTCUP EN LOS ESTABLECIMIENTOS FIJOS O MÓVILES EN LA CIUDAD DE SÃO PAULO (SP), 2014 -2015

RESUMEN

Introducción: El desarrollo de la sociedad lleva a las alteraciones de los estilos de vida, con fuertes cambios en las rutinas alimentares del consumidor, estimulando a la evolución de la tecnología de embalaje y favoreciendo un considerable aumento de la oferta de los alimentos previamente preparados, donde, condiciones de tiempo y temperatura de contacto, entre producto y embalaje, también son críticos para la determinación de riesgo potencial de contaminación. **Objetivo:** Determinar la presencia de la flora microbiana en las biznagas plásticas conteniendo mayonesa, mostaza y ketchup, en establecimientos fijos o móviles de la ciudad de São Paulo, bien como observar la higiene del sitio y de los manipuladores de alimentos. **Metodología:** El análisis microbiológica fue basada en la Resolución RDC 12 de ANVISA, de 02/01/2001, utilizando torundas que fueron pasadas en la boquilla de las biznagas de salsas preparada (mayonesa, mostaza y ketchup) y puestos en un soporte, debidamente identificados y transportados en cajas isotérmicas para el Instituto de Pesquisa y Estudios en Salud de São Paulo (IPESP) para realización de cultivo de placas lista, conteniendo Agar Chocolate, Agar Sangre, Agar MacConkey, Agar Sabouraud Dextrose, con temperatura de 37°C. Para auxiliar en los estudios, se fue confeccionado una lista de verificación, para averiguar las buenas prácticas de la higiene, así como la Resolución n° 275, Resolución n° 216 y Portería n° 326. **Resultados:** Se fue observado que, entre las muestras recogidas de las biznagas de ketchup, mostaza y mayonesa, por el método de torundas, dieron 34% positivas, en la análisis individual de las biznagas, fue obtenido la positividad de 18% ketchup, 4% mostaza y 12% mayonesa. **Conclusión:** Por los resultados obtenidos, se fue observado que existe la presencia de la flora microbiana en las biznagas plásticas de los establecimientos pesquisados, lo que lleva al comprometimiento de la seguridad alimentar, llevando manifestaciones infecciosas. En lo que concierne la higiene del local y de los manipuladores, ambos eran inadecuados, contrariando las normas establecidas por la ANVISA y por los Estados y Municipios.

PALABRAS CLAVE: Microbiológica de alimentos, biznagas plásticas, legislación en alimentos, seguridad alimentar, salsa para sándwiches.

VERIFICAÇÃO DA PRESENÇA DE FLORA MICROBIANA EM BISNAGAS PLÁSTICAS DE MAIONESE, MOSTARDA E KETCHUP EM ESTABELECEMENTOS FIXOS OU AMBULANTES DA CIDADE DE SÃO PAULO (SP), 2014 - 2015.**RESUMO**

Introdução: O desenvolvimento da sociedade leva a alterações dos estilos de vida, com fortes mudanças nos hábitos alimentares do consumidor, estimulando a evolução da tecnologia de embalagem e favorecendo um considerável aumento da oferta de alimentos pré-preparados, onde, condições de tempo e temperatura de contato entre produto e embalagem também são críticos para a determinação do risco potencial de contaminação. **Objetivos:** Determinar a presença de flora microbiana em bisnagas plásticas contendo maionese, mostarda e ketchup, em estabelecimentos fixos ou ambulantes da Cidade de São Paulo, bem como observar a higiene do local e dos manipuladores de alimentos. **Metodologia:** A análise microbiológica foi baseada na Resolução RDC 12 da ANVISA, de 02/01/2001, utilizando "swab's" que foram passados no bocal das bisnagas para molhos prontos (maionese, mostarda e de ketchup) e colocados em suporte, devidamente identificados e transportados em caixas isotérmicas para o Instituto de Pesquisa e Estudos em Saúde de São Paulo (IPESP) para realização de cultura em placas prontas, contendo Ágar Chocolate, Ágar Sangue, Ágar MacConkey, Ágar Sabouraud Dextrose, a temperatura de 37° C. Para auxiliar no estudo, confeccionou-se um check-list, para verificação das boas práticas de higiene, segundo às Resolução nº 275, Resolução nº 216 e Portaria nº 326. **Resultados:** Observou-se que, dentre as amostras colhidas das bisnagas de ketchup, mostarda e maionese, pelo método swab, deram 34% positivas, na análise individual das bisnagas, obteve-se a positividade 18% ketchup, 4% mostarda e 12% maionese. **Conclusão:** Pelos resultados obtidos, observou-se que existe a presença de flora microbiana nas bisnagas dos estabelecimentos pesquisados, o que leva ao comprometimento da segurança alimentar, levando a quadros infecciosos. No que concerne à higiene do local e dos manipuladores, ambos eram inadequadas, contrariando as normas estabelecidas pela ANVISA e pelos Estados e Municípios.

PALAVRAS-CHAVE: Microbiologia de alimentos, bisnagas plásticas, legislação em alimentos, segurança alimentar, molhos para lanches.