DOWNLOAD PDF MICROBIOLOGICAL CONCERN OF HUMAN BREAST MILK

Chapter 1 : Microorganisms of Concern in Milk | calendrierdelascience.com

Human babies appear to need more of a nutritional boost from breast-milk proteins than do infants of one of their closest primate relatives, suggests a study comparing human milk with the milk of.

Published online Nov The authors declare that no competing interest exist. Conceived and designed the experiments: Reviewed and approved the last version manuscript: Received Jul 31; Accepted Oct 1. This article has been corrected. This article has been cited by other articles in PMC. Abstract Background Human milk and infant gut microbiota are essential for the immune system maturation and protection against infections. There is scarce information on the microbiological composition of breast milk in general, and none from developing countries. The objective of the study was to characterize the breast milk and gut microbiota from mothers and infants from southern Mozambique, where infections and breastfeeding are prevalent. Methods A community-based study was undertaken among pairs of women and infants. Results The most frequent bacterial groups isolated by culture media in breast milk were Staphylococci Women on exclusive breastfeeding presented higher proportion of S. Bacterial diversity mean number of bacterial species isolated by sample: These findings provide insights into interactions between commensal bacteria and HIV infection in human milk and the role of these bacteria in mucosal protection against infections in breastfed infants. Apart from this nutritive role, human milk also influences the development of the immune system through intestinal microbe colonisation [2] , [3]. Moreover, some microbiological strains isolated in breast milk samples have probiotic properties [4]. It has been shown that the natural microbiota of the human mammary gland is composed by staphylococci, streptococci, lactic acid bacteria LAB , propionibacteria and closely related Gram-positive bacteria, and bifidobacteria [5] , some of which such as Lactobacillus gasseri and Enterococcus faecium can potentially prevent infections in breastfeeding infants [6] , [7]. Similarly, bifidobacteria and LAB are used as probiotics, and the efficacy of the latter to treat lactational mastitis has recently been shown [8] , [9]. In vitro studies have also shown that commensal LAB from human breast milk inhibit HIV-1 virus, suggesting a possible role of these bacteria in mucosal protection against HIV in the exposed breastfed infant [5] , [10]. Despite all the information on the potential influence of the breast milk and gut microbiota on the host health, there is very limited information on the composition of commensal and potentially probiotic bacteria in the human milk of healthy women. This may be particularly important in developing countries, where infections are frequent and breastfeeding is common [16] â€" [18]. Written informed consent was obtained from all study participants. Informed consent from legal guardians of minors participating in the study was not specifically requested. Study participants were all breastfeeding mothers who were considered autonomous and independent to decide on their participation on the study, according to the aforementioned Ethics Committees that reviewed and approved the informed consent procedures. The study area and population characteristics have been described in detail elsewhere [19] , [20]. Prevalence of exclusive breastfeeding in children less than 6 months of age was 5. Study design This is a cross-sectional, community-based descriptive study of the microbiological composition of breast milk from apparently healthy women and the faeces of their breastfeeding infants. The target sample size was 30 pairs of mothers and infants per age group. Recruitment and sample collection Study candidates were visited at home by a field worker who explained the study objectives and procedures. Inclusion criteria for women were being resident in the study area, having given birth in the previous 12 months a living child currently being breastfed, and signing the study informed consent following counselling. Demographic, nutritional data, and information of breastfeeding practices, history of known diseases, and current treatments from the mother and infant were collected onto standardised questionnaires. The maternal nutritional status was assessed by measuring the mid upper arm circumference MUAC. Study infants were weighed using a digital scale. Five mL breast milk samples were collected into sterile tubes. Study women were asked to discard the first 2 drops of milk and to fill in the tubes directly by manual expression. In parallel, the same samples were also cultured on the Man, Rogosa, and Sharpe MRS, Oxoid; a medium for the isolation of lactic acid bacteria and bifidobacteria agar plates, supplemented with cysteine 0. The selected isolates were observed by optical microscopy to determine their morphology and Gram staining. Additionally, they were tested for catalase, oxidase and coagulase activities and for growth on plates of two selective media: Briefly, a fraction of the milk sample 1 mL was initially centrifuged at 7. Malnutrition was defined as a weight for age WAZ Z-score lower than Results Study participants A total of households were visited and women were finally seen and invited to participate in the study. Of them, accepted to participate in the study acceptance rate A total of breast milk and faecal samples were collected. The demographic characteristics of study participants are presented in Table 1. Four women reported being on medical treatment amoxicilline, paracetamol, cotrimoxazole and antihypertensive drugs respectively at the time of the household visit. The proportion of infants receiving exclusive breastfeeding at the time of the interview differed among the four age groups: The proportion of exclusive breastfeeding in infants aged less than 6 months was

Chapter 2 : Immune factors in human milk â€¢ calendrierdelascience.com

The bacteria in breast milk. Bacteria are found in large numbers all over the human body where there is a channel to the outside world, for example in the gut, lungs, and surface of the skin.

American Academy of Pediatrics AAP strongly recommends exclusive breastfeeding for the first six months of life and that breastfeeding continues for at least 12 months. It is optimal for both babies and mothers. For babies, it can protect against infections and reduce the rates of later health problems including diabetes , obesity, and asthma. For mothers breastfeeding helps the uterus to contract and bleeding to cease more quickly after delivery. Breastfeeding can reduce the risk of breast and ovarian cancer and also provides a great way for mothers to bond with their babies. Find a Lactation Consultant in your area The advantages of breastfeeding are numerous. Breast milk is ultimately the best source of nutrition for a new baby. Many components in breast milk help protect your baby against infection and disease. The calcium and iron in breast milk are also more easily absorbed. Nutrients Found in Breast Milk The following is a brief overview of the components of breast milk and the nutrients they provide for your baby: Proteins Human milk contains two types of proteins: This balance of the proteins allows for quick and easy digestion. If artificial milk, also called formula, has a greater percentage of casein, it will be more difficult for the baby to digest. These proteins have great infection-protection properties. Listed below are specific proteins that are found in breast milk and their benefits: Lactoferrin inhibits the growth of iron-dependent bacteria in the gastrointestinal tract. This inhibits certain organisms, such as coliforms and yeast, that require iron. Secretory IgA also works to protect the infant from viruses and bacteria, specifically those that the baby, mom, and family are exposed to. It also helps to protect against E. Coli and possibly allergies. Other immunoglobulins, including IgG and IgM, in breast milk also help protect against bacterial and viral infections. Eating fish can help increase the amount of these proteins in your breast milk. Lysozyme is an enzyme that protects the infant against E. It also promotes the growth of healthy intestinal flora and has anti-inflammatory functions. Bifidus factor supports the growth of lactobacillus. Lactobacillus is a beneficial bacteria that protects the baby against harmful bacteria by creating an acidic environment where it cannot survive. Fats Human milk also contains fats that are essential for the health of your baby. It is necessary for brain development, absorption of fat-soluble vitamins, and is a primary calorie source. Long chain fatty acids are needed for brain, retina, and nervous system development. They are deposited in the brain during the last trimester of pregnancy and are also found in breast milk. This is why it is essential that she gets adequate nutrition, including vitamins. Water-soluble vitamins such as vitamin C, riboflavin, niacin, and pantothenic acid are also essential. Because of the need for these vitamins, many healthcare providers and lactation consultants will have nursing mothers continue on prenatal vitamins. Carbohydrates Lactose is the primary carbohydrate found in human milk. Lactose helps to decrease a large number of unhealthy bacteria in the stomach, which improves the absorption of calcium, phosphorus, and magnesium. It helps to fight disease and promotes the growth of healthy bacteria in the stomach. Breast Milk is Best for Your Baby Breast milk has the perfect combination of proteins, fats, vitamins, and carbohydrates. There is nothing better for the health of your baby. Leukocytes are living cells that are only found in breast milk. They help fight infection. It is the antibodies, living cells, enzymes, and hormones that make breast milk ideal. These cannot be added to formula. Though some women ultimately are not able to breastfeed, many who think they cannot actually are able to breastfeed. Lactation consultants are able to provide support to women learning to breastfeed. For those who are not able to breastfeed, milk banks or donor milk may be an alternative. May 24, at Clinical Strategies for Nurses.

Chapter 3 : Storing and thawing breast milk | Medela

The sale of human breast milk on the internet poses serious risks to infant health and needs urgent regulation, argue experts.

Here, to identify the breast milk bacteria capable of colonizing gut without the interference of bacteria of origins other than the milk or the necessity to analyze infant feces, normal chow-fed germ-free mice were orally inoculated with the breast milk collected from a mother 2 days after vaginal delivery. The human breast milk microbiota-associated mouse model may be used to identify additional breast milk bacteria that potentially colonize infant gut. Introduction Although human breast milk-associated microbiota is dominated by skin-associated bacteria Staphylococcus and Streptococcus Jost et al. To investigate what breast milk bacteria can colonize infant gut, i. From thousands of bacterial isolates of the maternal breast milk and infant feces, only a limited number of bacterial species Bifidobacterium breve, B. Germ-free mice provide an animal model in which the source of commensal bacteria can be strictly controlled and microbiological contamination from other origins is avoided. They have been shown to be an effective surrogate host of human gut bacteria Kibe et al. A human baby microbiota, which consisted of bacteria of Bacteroides, Enterobacteria, Bifidobacterium, Lactobacillus, and Staphylococcus isolated from the feces a day-old female baby, can stably colonize the gut of germfree mice Martin et al. No previous study has transplanted human breast milk microbiota to germfree mice to screen for the breast milk bacteria that can colonize the gut. In the present study, germ-free mice fed on normal chow were inoculated orally with the breast milk of one year-old mother 2 days after vaginal delivery, and the microbiota composition of milk inoculum and mouse feces were compared with 16S rRNA gene profiling and microbiological culture techniques. Materials and Methods Subject and Breast Milk Collection The breast milk was collected from a year-old mother 2 days after vaginal delivery at term. The mother had gestational diabetes mellitus during pregnancy the serum glucose levels of Oral Glucose Tolerance Test were fasting 4. She had no gastrointestinal diseases, immunological disorders, infectious diseases, or organic diseases. The mother received no antibiotics within 3 months before breast milk sampling, and she performed exclusive breastfeeding when the milk sample was collected. Written informed consent was obtained from the mother before the participation in the study. The breast milk was immediately transported to the lab in an anaerobic jar. Aliquots of the breast milk were inoculated to germ-free mice, and processed for bacterial cultivation in an anaerobic chamber within 2 h after collection. They were provided with sterile normal chow containing 4. Periodic bacteriologic examination of feces with bacterial cultivation was performed to make sure there was no bacterial contamination. The experiment lasted 8 weeks since the first inoculation. At week 8, one aliquot of the feces collected from No. For the feces of mice, one fecal pellet was homogenized in 0. Total DNA was extracted from the resultant bacterial cell pellets as previously described Godon et al. The integrity of the DNA was assessed by using 0. The PCR program included the following steps: The sizes of PCR products were assessed using 1. Quantity One software version 4. Bands migrating to an identical position were considered to represent the same bacterial species. Positive clones were picked randomly, and inserts were amplified and screened for their migration position by DGGE. The PCR cycle number was reduced to 21 to diminish bias. Based on different morphologies, colonies were randomly selected per sample and agar medium, streaked three times for purity and cultured in liquid Anaerobe Basal Broth medium [ABB] Nissui, Qingdao, China. The amplification program was as follows: A 25 cycles PCR program was performed as follows: Positive clones were picked randomly, amplified with T7 and SP6 as the primers. For each isolate, three positive clones were sequenced Life Technologies, Shanghai, China. A neighbor-joining phylogenetic tree containing the sequences and their relatives was constructed with the Molecular Evolutionary Genetics Analysis package MEGA5 with the Jukes-Cantor algorithm. The phylogenetic robustness was assessed by bootstrap analysis with replicates using the same software. The taxonomy of the bacterial isolates and bacteria represented by the DGGE bands was determined based on the position of their sequences in the phylogenetic tree. For the raw data of Illumina sequencing of 16S rRNA gene V3â€"V4 amplicons, both the forward and reverse ends of the same read were truncated at the first base where the Q value became no more than 2. The merged reads that were longer than nt with an expected error of no more than 0. Quality-filtered reads were delineated into unique sequences and then sorted by decreasing abundance, and singletons were discarded. Sequence data were rarefied to 25, reads per sample 1, permutations to avoid bias caused by the difference in sequencing depth. DGGE profiling of the bacterial communities in the breast milk inoculum and feces of recipient mice. A The weekly monitor of the gut microbiota composition of one recipient mouse No. C The comparison of the bacterial composition between the breast milk inoculum and the feces of recipient mice at 8 weeks. The fecal microbiota of recipient mice became stabilized by 2â€"4 weeks after gavage according to clustering dendrogram of DGGE profiles of mice at different time points Figures 1A,B and Supplementary Figure S1. This suggests that despite the small inter-individual variation, the composition of gut microbiota of different recipient mice was similar but was significantly different from that of the breast milk inoculum. There were six bands in the profile of the breast milk; and among them, three were from Staphylococcus lugdunensis-like species, one from a Streptococcus infantis-like species, and two from Streptococcus salivarius-like species Figure 2. Indicated are the band ID, the representative clones, the bacterial species most closely related to the clones, and the levels of similarity. Only two breast milk bands band 3M and 4M , from a S. Band 4M and 5M from a Str. OTUs detected in both the breast milk inoculum and feces of recipient mice at week 8. OTUs detected in the breast milk inoculum but not in the feces of recipient mice at week 8. OTUs detected only in the feces of recipient mice at week 8 but not in the breast milk inoculum. These bacteria were detected at multiple time points from weeks 1 to 8 in mice harboring them. Moreover, their abundances stayed at 0. Bacteria from Bifidobacterium, represented by OTU55 and OTU19, were not detected in the breast milk inoculum, but were detected at abundance 0. WCH and M17 media were used because previous studies showed the majority of bacteria isolated from human breast milk grew on WCH medium Jost et al. The viable bacterial counts in the breast milk inoculum were log 5. The bacterial counts of mouse feces were 9. One hundred and eighty-six isolates on WCH, and 40 on M17 and isolates on WCH, and on M17 were isolated from the breast milk inoculum and the mouse feces, respectively. The taxonomy of the isolates was determined at the species-level by constructing a phylogenetic tree with the full-length 16S rRNA gene sequences of the representative strains of individual ERIC types Figure 3 , and the abundance of each bacterial species in the original sample was calculated as its percentage accounting for the total number of all isolates of the sample. Among the breast milk isolates, Among the mouse fecal isolates, however, the percentage of Staphylococcus spp. Phylogenetic tree of the representative bacterial isolates of 17 ERIC types and other known bacteria. The tree was constructed based on the region from base 27 to base of the 16S rRNA genes. Bacterial strains retrieved from the GenBank database are indicated by italics, and their accession numbers are given. The taxonomy and abundance of the bacteria isolated from the breast milk inoculum and the feces of No. These results suggest Str. Discussion Our results suggest that typically gut-associated bacteria detectable in human breast milk are alive and could stably colonize the intestine of germ-free mice. These bacteria are among the first colonizers in the colon of human infants within the first weeks of life Palmer et al. Of note, Streptococcus spp. Bacteria within Faecalibacterium, Prevotella, Roseburia, Unclassified Lachnospiraceae, Ruminococcus, and Bacteroides are dominant gut bacteria in children and adults Eckburg et al. In the present study, the breast milk inoculum was the only source of commensal bacteria for the recipient mice, and bifidobacteria were detected in the feces of recipient mice but not in the breast milk inoculum with Illumina sequencing of 16S rRNA gene. This suggests that the gut of our breast milk microbiota-associated mice enriched bifidobacteria despite their abundance in the milk inoculum below the detection limit of Illumina sequencing of 16S rRNA gene. Among the bacteria discussed above, except Staphylococcus and Bifidobacterium Martin et al. Therefore, our results indicate the breast milk microbiota-associated mouse model can be used to identify additional breast milk bacteria that have the potential to colonize infant gut. In human neonates, Propionibacterium spp. In the present study, the human breast milk Propionibacterium spp. The very low abundance of Corynebacterium and Propionibacterium in the milk inoculum, which was as low as 0. In contrast, the obligatory anaerobes, Faecalibacterium, Prevotella, Roseburia, Unclassified Lachnospiraceae, Ruminococcus, and Bacteroides stayed at very low abundance in recipient mice 0. The dominance of aerobic or facultative anaerobic bacteria over obligatory anaerobes in the colon of our recipient mice resemble the observation of gut microbiota composition of human neonates in the first week of life Palmer et al. However, while the aerobic or facultative anaerobic bacteria are replaced by obligatory anaerobic bacteria within first weeks of life in the gut microbiota of human infants Palmer et al. This indicates that factors that promote the growth of obligatory anaerobes in the gut are lacking for the breast milk microbiota-associated mice. Diet exerts a determinant effect in shaping the composition of gut microbiota. In human infants, breast feeding results in bifidobacteria-dominating gut microbiota Charbonneau et al. In human adults, prebiotic inulin ingestion significantly increases the abundance of Faecalibacterium prausnitzii Ramirez-Farias et al. In future studies, it would be worthwhile to feed the breast milk microbiota-associated mice with formula and prebiotics, which may enrich obligatory anaerobes in the gut of these mice. This breast milk microbiota-associated mouse model might provide an alternative way to isolate the gut-associated bacteria from the breast milk. Heikkila and Saris, ; Jimenez et al. In agreement with these previous findings that bacterial isolates of the breast milk were predominantly Staphylococcus, the bacterial cultivation in the present study showed Staphylococcus accounted for In contrast, in the feces of our breast milk microbiota-associate mice, the percentage of Staphylococcus isolates decreased to only Furthermore, our results showed that the facultative anaerobic gut-associated bacteria from the breast milk inoculum stably colonized the gut of recipient mice, and that obligatory anaerobes were repeatedly detected at multiple time points in some recipient mice. These results suggest breast milk microbiota-associated mice can serve as sustainable carriers for these bacteria and can continuously provide feces for isolation of these bacteria. In conclusion, our results showed the typically gut-associated bacteria in human breast milk could colonize the gut of germfree mice, and this breast milk microbiota-associated mouse model may be used to identify additional breast milk bacteria that can colonize the gut and are thus potentially involved in human mother-infant bacterial transfer via breast feeding. Conflict of Interest Statement The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest. Supplementary Material The Supplementary Material for this article can be found online at: Enterotypes of the human gut microbiome.

Chapter 4 : Breast Milk and Gut Microbiota in African Mothers and Infants from an Area of High HIV Preval

Comparison of the risk of microbiological contamination between samples of breast milk obtained at home and at a healthcare facility / and then isolated on xylose-lysine-desoxycholate.

The objectives of the present study were to determine the prevalence of potentially pathogenic microorganisms that indicate the hygienic and sanitary conditions of human milk samples collected at a Human Milk Bank. The latter were plated on McConkey agar according to the type of bacteria. Among the total number of samples collected, consisted of raw milk and the remaining were pasteurized milk. The presence of Staphylococcus spp. Staphylococcus aureus were isolated in 10 5. In a hundred and forty four samples which underwent thermal treatment Staphylococcus aureus was detected in five 3. Analysis indicated a high degree of contamination in raw human milk, and as for the pasteurized milk, despite elimination of the great majority of potentially pathogenic microorganisms, the percentage of yeasts and molds was higher than in raw milk, demonstrating that a lower degree of initial contamination would be necessary for pasteurization to be an efficient means of microbiological control. INTRODUCTION Exogenous infections, originating from the hospital environment, deserve greater attention from public health professionals than endogenous ones, for human beings are the sources of the agents that provoke them. The former include hospital employees, patients and visitors as well as hospital instruments and equipment. Among these sectors, particular attention should be given to the nursery, due to cross-contamination or to the transmission of pathogenic or potentially pathogenic microorganisms by means of milk stored in the human milk bank, which may be considered a potential microbiological risk factor. It is widely acknowledged that for breastfed infants, the first six months can be the healthiest period in their lifetime. Furthermore, due to physiological or emotional problems, some mothers are unable to produce milk. On the other hand, milk derived from other animals may cause allergies. For these as well as for other reasons, many infants are fed milk from human milk banks HMB , supplied by voluntary donors who produce a surplus. The microbiological quality of expressed milk distributed by these milk banks is a public health issue, for the children who will consume this product have low resistance to neonatal infections. Bacteria pertaining to the Stapphylococci gender were tested for their capacity to produce coagulase and resistance to novobiocin. As to the Streptococci, based on hemolysis, tests of resistance to bacitracin, optochin and other biochemical tests were conducted. In order to identify gram-negatives, screening was undertaken in triple sugar iron TSI agar and identification was obtained by means of biochemical tests. Among the samples of raw milk, Streptococci of the viridans group were isolated in three 2. Microorganisms were identified in seventy-three of the samples of pasteurized milk from the HMB. Among these, Staphylococcus lugdenensis, Streptococcus pyogenes, and Streptococcus of the viridans group were isolated in two 2. DISCUSSION The presence of high levels of contaminants in raw human milk entails in a reduction of its biological benefits because its nutrients are being utilized by the microflora present in the milk, thus diminishing its protective immunological qualities. Furthermore, the greater the quantity and diversity of microorganisms present in the milk, the less efficient will the outcome of the process of pasteurization be. It may be noted that there is a great gap in the criteria for selection of milk for pasteurization. The greatest concern with respect to its presence is the occurrence of strains which produce toxins that are resistant to pasteurization. Among the 19 samples, 8 synthesized detectable quantities of enterotoxins, being that in some cases, it was observed that they also produced the toxin of the toxic chock syndrome. As to the raw milk, the results presented in this study are similar to those reported by Caroll et al7 who observed S. Other researchers found coagulase positive Staphylococcus in different proportions of human milk samples submitted to analysis: Other authors found E. The present results reveal the presence of enterobacterias in Therefore, they presented inferior hygienic conditions than the studies cited above. The presence of molds and yeast in foods may also indicate contamination originating from the environment or resulting from handling in inadequate hygienic and sanitary conditions. Other researchers, however, observed that 6. However, the percentages of molds and yeast detected in the pasteurized milk The presence of pathogenic yeast in pasteurized human expressed milk suggests that this could be a source of infection to neonates during breastfeeding. Quality control by means of yeast counts in expressed human milk may be a good indicator of problems related to hygiene, storage or transportation. According to this resolution, 4. Taking into consideration the results obtained, the authors believe that efforts should be made to improve the microbiological control of expressed human milk, including the milk which is going to be pasteurized. In this sense, more rigorous measures for monitoring the quality of human milk are indispensable so as to guarantee safe feeding for neonates. Rev Inst Mat Inf Pernambuco ;3: Qualidade do leite humano coletado e processado em bancos de leite humano [Tese de mestrado]. Rev Paul Hosp ; Collecting and banking human milk: Bacteriological criteria for feeding raw breast-milk to babies on neonatal units. Eidelman AI, Szilagyi G. Patterns of bacterial colonization of human milk. Normal flora in health and disease. Mandell, Douglas, Bennilt, editors. Principles and pratice of infectious disease. Bacteriological quality control in a human milk bank. Color atlas and textbook of diagnostic microbiology. Is ingestion of milk-associated bacteria by premature infants fed raw human milk controlled by routine bacteriologic screening? J Clin Microbiol ; Vanderzant C, Splittstoesser DF, editors. Compendium of methods for the microbiological examination of foods. American Public Health Association; Microflora in human milk sample. Staphylococci in breast milk from women without mastites. Rev Hig Alimentar ;6: Yeasts from human milk collected in Rio de Janeiro, Brazil. Acta Microbiol Acad Sci Hungarian ; Collection methods and contamination of bank milk. Arch Dis Child ; Rev Hig Alimentar ;3:

Chapter 5 : Adult health craze for human breast milk poses risks - CBS News

Fecal matter can also be a source of contamination in human milk when poor hygienic conditions exist [33, 34, 35]. All, or some, of these routes of bacterial transfer have the potential to contribute to the microbiota of human milk.

In some cases long-lasting symptoms of fever, joint pain and fatigue may occur. Campylobacter jejuni Campylobacter jejuni is found in the intestinal tract, udder, and feces of cattle, in poultry and wild birds, and in contaminated water sources. Campylobacter jejuni is destroyed by pasteurization. Campylobacter jejuni is one of the most common bacterial causes of diarrheal illness in the US. Illness can often occur as sporadic events and in larger outbreaks. Campylobacter jejuni generally causes illness 2 to 5 days after exposure, and illness typically lasts 5 to 10 days. Symptoms of campylobacteriosis include diarrhea, bloody diarrhea, abdominal pain, cramping, nausea, vomiting, and fever. Patients with Campylobacteriosis usually recover without specific treatment other than fluid and electrolyte replacement. Reiter syndrome is a reactive arthritis that may affect multiple joints, particularly the knee joint. The prevalence of Campylobacter jejuni is very widespread. It has been reported in bulk tank raw milk samples in Illinois, Michigan, Minnesota, Ohio, Pennsylvania, South Dakota, Tennessee, Virginia, and Wisconsin, suggesting that the organism is ubiquitous. In these studies, Campylobacter jejuni was found in 0. Coxiella burnetii Coxiella burnetii is found in many animals worldwide and is shed in the milk, urine and feces of cattle, goats, and sheep. Coxiella burnetii is considered to be the most heat resistant non-sporeforming pathogen commonly found in milk, and the established conditions for milk pasteurization are specifically designed to destroy this organism. Coxiella burnetii causes Q fever, an illness characterized by a sudden onset of high fever, severe headache, nausea, vomiting, diarrhea, abdominal pain, chest pain, chills, sweats, sore throat, non-productive cough, and general malaise. Fever can last for 1 to 2 weeks. Most patients recover without any treatment, although Coxiella burnetii may result in death. H7 Escherichia coli O H7 is one strain in a large family of bacteria. Strains of Escherichia coli E. Most strains of Escherichia coli do not cause illness and live in the intestinal tracts of healthy humans and animals. H7 is found in the intestinal tract and feces of cattle. H7 is destroyed by pasteurization. H7 produces toxins that cause illness in humans. Symptoms of illness include bloody diarrhea and abdominal cramps. In some cases, particularly in young children, E. H7 infection causes hemolytic uremic syndrome, which destroys red blood cells and causes kidney damage or failure, and in some cases death. The prevalence of E. H7 and Shiga-toxin producing E. H7 was found in 0. Listeria monocytogenes Listeria monocytogenes is found in soil and water and has been isolated from a large number of environmental sources. Listeria monocytogenes is destroyed by pasteurization, but if food products are contaminated after pasteurization, Listeria monocytogenes can grow at refrigerator temperatures. Illness can occur as sporadic events or larger outbreaks. Listeria monocytogenes typically causes illness in pregnant adults, newborns, the elderly, and patients with compromised immune systems, but healthy adults and children may also become infected. Symptoms of Listeriosis include flu-like symptoms, fever, muscle aches, stiff neck, headache, septicemia, meningitis, miscarriage, stillbirth, premature delivery, abortion, or death. Mycobacterium bovis and Mycobacterium tuberculosis Mycobacterium bovis and Mycobacterium tuberculosis are found in infected cattle worldwide. Both of these organisms are destroyed by pasteurization. Mycobacterium bovisand Mycobacterium tuberculosiscause tuberculosis, a lung disease. Tuberculosis in the US is not very common today, although historically milk was a common source of tuberculosis. Tuberculosis is a concern in many parts of the world. Salmonella has been found in the intestinal tracts of all warm-blooded animals including humans. Salmonella is destroyed by pasteurization. Symptoms of Salmonellosis include diarrhea, abdominal cramps, and fever. Most people recover without treatment other than fluid and electrolyte replacement. Some cases may be severe and require hospitalization. A small number of people may develop Reiter syndrome, which is a reactive arthritis that may affect multiple joints, particularly the knee joint. The prevalence of Salmonella spp. Yersinia enterocolitica Yersinia enterocolitica is found in the intestinal tract of farm animals, especially pigs, and in the environment. Yersinia enterocolitica is destroyed by pasteurization, but if food products are contaminated after pasteurization, Yersinia enterocolitica can grow at refrigerator temperature. Yersinia enterocolitica causes illness with symptoms of fever, abdominal pain and diarrhea. Yersinia enterocolitica was found in 1. McManus and Lanier reported Yersinia enterocolitica in Most coliforms are not pathogenic, but their presence indicates contamination, usually from fecal sources. Coliforms are destroyed by pasteurization. Psychrotrophic Bacteria Psychrotrophic bacteria are not a specific type or family of bacteria, but rather this is the name given to bacteria that are capable of growing at This group of microbes is a concern in dairy products because they grow at refrigerator temperature and cause spoilage, often resulting in off-flavors. The most common psychrotrophs are in the genus Pseudomonas. These organisms are killed by pasteurization, but may occur in milk from contamination after pasteurization. Some bacterial pathogens are psychrotrophic, including Listeria monocytogenes , Yersinia enterocolitica , some E.

Chapter 6 : - NLM Catalog Result

In addition, if human milk is not handled and stored properly, it could, like any type of milk, become contaminated and unsafe to drink.

Before expressing breast milk, mothers should wash their hands with soap and water or an alcohol-based hand sanitiser. The pump parts, bottles and pumping area must be clean. Breasts and nipples do not need to be washed before pumping. Use of a medical grade refrigerator with temperature uniformity and constant temperature monitoring is recommended. These storing and thawing breast milk guidelines are a recommendation. National and hospital internal guidelines and standards may deviate. Storage guidelines Milk can be stored safely at room temperature for a short period of time. Although studies differ in terms of the exact recommended period, in general, warmer temperatures are associated with higher bacterial counts in expressed milk. At lower room temperatures, storage for up to six hours may also be reasonable in clean environments. Refrigeration has been shown to inhibit gram-positive bacterial growth for up to three days. At three months vitamins A, E and B, total protein, fat, enzymes, lactose, zinc, immunoglobulins, lysozyme and lactoferrin are maintained, although there may be vitamin C loss after one month. Bacterial growth is not a significant issue for up to six weeks. The antibacterial capacity, however, is generally less than that of fresh milk, due to the loss of live cells such as phagocytes. After freezing, milk can be thawed in the refrigerator, or by using a container of warm water or by running it under warm water. Thawing breast milk with very hot water, microwaves and stoves should be avoided since high heating temperatures can reduce the antibacterial and other bioactive properties of milk. Thawing is complete when the frozen milk has become liquid, is still chilled and some ice crystals are still present. The presence of ice crystals is a visible indicator that the milk has not thawed beyond a certain point. Thawed milk should then be refrigerated until immediately before use and not left at room temperature for more than a few hours to prevent bacterial growth. Re-freezing milk after thawing it in the fridge has been shown to maintain a safe bacterial load; however, it has been suggested that milk that has been completely thawed to room temperature should not be re-frozen. Study abstracts A central goal of The Academy of Breastfeeding Medicine is the development of clinical protocols for managing common medical problems that may impact breastfeeding success. For a long time, microbiological analysis of human milk was only performed Contamination of breast milk obtained by manual expression and breast pumps in mothers of very low birthweight infants. J Hosp Infect 49, Contamination of expressed human breast milk with an epidemic multiresistant Staphylococcus aureus clone. J Med Microbiol 49, A source of more life than we imagine. Benef Microbes 4, The human milk microbiome changes over lactation and is shaped by maternal weight and mode of delivery. Am J Clin Nutr 96, Effects of container upon immunologic factors in mature milk. Nutr Res 1, Eglash A, Simon L. ABM clinical protocol 8: Breastfeeding and the working mother: Effect of time and temperature of short-term storage on proteolysis, lipolysis, and bacterial growth in milk. Pediatrics 97, Refrigerator storage of expressed human milk in the neonatal intensive care unit. J Pediatr , Effects of refrigeration on the bactericidal activity of human milk: J Pediatr GastroenterolNutr ; Bactericidal activity of human milk: Br J Biomed Sci ; Effects of storage on the physicochemical and antibacterial properties of human milk. Cold storage of human milk: Effect on its bacterial composition. J Pediatr Gastroenterol Nutr 49, Effects of freezing on the bactericidal activity of human milk. J Pediatr Gastroenterol Nutr 55, Ahrabi AF et al. Effects of extended freezer storage on the integrity of human milk. Biol Neonate 65, Effect of environmental conditions on unpasteurized donor human milk. Breastfeed Med 1,

Chapter 7 : Breast milk - Wikipedia

The sale of human breast milk on the internet poses serious risks to infant health and needs urgent regulation, according to a new editorial in BMJ. The nutritional benefits of breast milk for babies are widely documented, but many *new mothers find it difficult or are unable to breastfeed.*

Chapter 8 : Microbiological quality of human milk from a Brazilian milk bank

Human milk and infant gut microbiota are essential for the immune system maturation and protection against infections. There is scarce information on the microbiological composition of breast milk in general, and none from developing countries.

Chapter 9 : Concerns over the online market of human breast milk

milk fortifiers in breast milk. When breast milk is unavailable for the infant in health care facilities, nutritionally appropriate ready to feed (RTF) formulas should be used as these are commercially sterile.