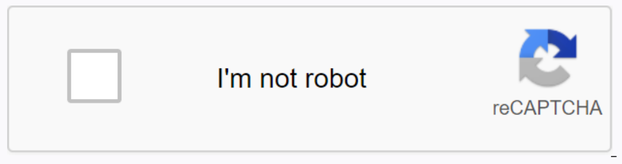

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Yogurt fermentation process pdf

Language: English | Indonesia 1 Food Technology Program, Faculty of Biotechnology, Atma Jaya Catholic University of Indonesia, Jakarta 12930, Indonesia Find the articles of Widya Agustinah 2Program of Biology, Faculty of Biotechnology, Catholic University of Atma Jaya of Indonesia, Jakarta 12930, Indonesia Find articles by Renna Eliana Warjoto 1Program of Food Technology, Faculty of Biotechnology , Atma Jaya University of Technology of Indonesia, Jakarta 12930, Indonesia Find the articles of Meda CantiReceiv Accepted 2018 November 14.Design an outreach program related to food fermentation for non-scientific participants that provides the opportunity to introduce the fundamentals of microorganisms and their application in food preservation. This program can be tailored to microbiology courses at the university level to help students understand the concept of food fermentation and control its processes. Yogurt is a fermented milk available commercially in Indonesia. While yogurt fermentation is usually carried out in a sealed fermenter in an aseptically controlled room, yogurt can also be done at home using start-cultured lactic acid bacteria, such as Lactobacillus delbrueckii ssp. bulgaricus and Streptococcus thermophilus, and apply proper hygienic and hygienological procedures. Yogurt making requires not only the proper ingredients but also an understanding of the microbial concepts of yogurt fermentation to allow control and modification of the fermentation process so that the final product is safe to consume. Through this activity, we have trained residents from a non-scientific background in Bogor, Indonesia, to produce simple and viable homemade yogurt using a variety of dairy substrates and the origins of startup culture. All participants prepared disinfectant kitchen ingredients and equipment, carried out yogurt fermentation and assessed the sensory properties of the product. Participants were challenged to discover the differences between different yogurt batches. This operation can be completed in two days, and the formula can be modified once the participants have understood the concept of yogurt fermentation. Pelaksanaan program pengabdian masyarakat tentang fermentasi pangan bagi peserta awam yang tidak berlatar belakang sains dapat memberikan peluang untuk mengenalkan prinsip dasar mikrobiologi dan aplikasinya dalam pengawetan pangan. Kegiatan ini dapat diadaptasikan dalam mata kuliah mikrobiologi pada program S1 agar dapat membantu mahasiswa memahami prinsip dasar mikrobiologi dan pengendalian proses yang melibatkan mikrobiologi dalam bidang pangan. Yogurt adalah salah satu jenis susu fermentasi yang tersedia secara komersial di Indonesia. Produksi yogurt umumnya dilakukan dalam fermented tertutup yang dikontrol secara aseptis. Selain itu, yoghurt juga dapat dibuat di rumah dengan menerapkan prosedur higienis dan sanitasi yang tepat using lactic acid bacteria starter cultures, such as Lactobacillus Lactobacillus ssp. bulgaricus dan Streptococcus thermophilus. Pembuatan yogurt tidak hanya memerlukan bahan-bahan yang sesuai, namun juga pengertian tentang konsep mikrobiologi fermentasi yogurt agar pembuat dapat mengendalikan sekaligus melakukan modifikasi terhadap proses fermentasi untuk menghasilkan produk akhir yang aman untuk dikonsumsi Melalui program ini, kami menyediakan pelatihan bagi warga awam yang tidak memiliki latar belakang sains dan tinggal di wilayah Bogor, Indonesian tentang pembuatan yogurt skala rumah tangga secara sederhana dengan memanfaatkan berbagai jenis substrat susu dan sumber kultur starter. Seluruh peserta menyiapkan bahan dan perlengkapan dapur yang telah disanitasi, mengerjakan proses fermentasi yogurt, dan mengevaluasi sifat sensori produk akhir. Peserta juga diminta untuk membahas perbedaan antara berbagai jenis yogurt yang telah dibuat. Kegiatan ini dapat diselesaikan dalam waktu dua hari dan bermanfaat memberikan pemahaman tentang konsep fermentasi yogurt sehingga peserta mampu melakukan modifikasi terhadap formulasi yogurt. Designing an outreach program related to food fermentation for non-scientific participants provides an opportunity to introduce the fundamentals of microbiology and their application in food preservation. Yogurt fermentation can be used as an active learning tool in which participants learn the principles of sterile techniques, clean and clean kitchen equipment, prepare substrates and culture bacteria, and control fermentation to create a safe product. This program can be tailored to microbiology courses at the university level to help students understand the concept of food fermentation and control its processes. Yogurt is famous for being a fermented milk that contains lactic acid-producing bacteria (LAB) and provides nutritional benefits for human health in improving digestive function and increasing life expectancy (1,2). Some LABs are commonly used in yogurt fermentation, such as Lactobacillus delbrueckii ssp. bulgaricus, L. acidophilus and Streptococcus thermophilus, converting lactose into lactic acid (3,4). The combination of these LABs in yogurt fermentation contributes to the acidity, taste and texture of the final product (1). Before fermentation, sugar and sweeteners can be added to milk to increase the viability of lab, thereby increasing the acidity of yogurt by reducing its pH (2,5). Commercial yogurt contains a number of sugars and LAB species that can be easily found in any grocery store. However, some Indonesian families prefer to make their own yogurt at home as it is cheaper and is considered healthier. Family members can choose their preferred milk for fermentation, which can include less fat, skim, full cream, or flavored milk. In addition, they can determine the amount of sugar added to milk and select their own LAB beginners, available on the market While yogurt fermentation is usually carried out in an airtight fermenter a tightly controlled room, yogurt can also be made at home using lab culture start equipment and apply appropriate hygiene and sanitation procedures. Since family members know and understand the ingredients and ingredients of their homemade yogurt, they tend to believe that it is healthier than commercial yogurt. Some family members may even start producing homemade yogurt for small-scale business purposes. Therefore, they require basic knowledge and skills to properly conduct yogurt fermentation. In this outreach, we provide training to residents in Bogor, Indonesia, for simple and viable yogurt production methods that are extended for home use. Participants are residents of Bogor, Indonesia, allocated into eight groups of five. They have prepared and disinfected kitchen equipment according to the process of making yogurt (Annex 1). All glass jars, wood stirrs and stainless steel spoons are washed with soap, washed with clean water, disinfected by soaking in boiling water, drying air, spraying 70% v/ v ethanol and drying air. The process of making yogurt is carried out in three steps: preparation of startup cultures, milk preparation and fermentation (Annex 1). This was followed by a sensory assessment of ready-made yogurt prepared earlier by controlled lab trainers and homemade yogurt produced by participants in the outreach program. Ready-made yogurt is made with the same recipe used to train and acquaint participants with the sensory properties of yogurt, including taste, texture (consistency), aroma and color. Two types of cultured lab starter have been used as inoculum and four types of milk as substrates. In food fermentation laboratories, monocrysal cultures of L. delbrueckii ssp. bulgaricus and S. thermophilus were previously prepared by trainers by developing the pure cultures of LAB into sterilized skid milk and brewing them at 37°C for 16 to 18 h (6). Another type of inoculum is commercial pure yogurt containing the living cultures of L. delbrueckii ssp. bulgaricus and S. thermophilus, as described in the packaging label. Various milks have been purchased from a grocery store, including skim milk, full sterilized milk (whole), processed whole milk (UHT) and UHT processed low-fat milk. All milk is purchased in liquid form, except skim powdered milk. Sugar has been added to skim powdered milk, then dissolved in boiled water first and sterilize at 85°C for 15 minutes. Through this step, participants were taught about the importance of heat treatment on dairy substrates and the effect of sugar supplementation on finished yogurt. Sugar has been added to skim milk to provide an additional carbon source for LAB (7). Pasteurized milk and UHT milk are warmed to 40 °C and used directly for vaccination without any additional ingredients. Concentration of Commercial pure yogurt used as inoculum has been doubled from mono-strain cultures to combat the potential dilution of the number of bacteria in commercial products. This treatment can mimic the backslopping technique used in various food fermentations (8). All glass bottles containing vaccination milk are placed on a clean, disinfected bench. Milk fermentation is carried out at room temperature (28-30 ° C) for 24 hours, instead of using an hamlet, to mimic the limits of the device in the kitchen. Fermentation requires a longer incubation period due to the lower temperature at the incubation location. Such modifications and reasonings were explained to the participants to demonstrate how to control bacterial growth. After fermentation, participants were asked to analyze the pH, observe texture, color and aroma, and finally taste yogurt (Appendix 2). Yogurt making is done in a home-scale kitchen after the procedure has been approved by the quality assurance team at the Faculty of Biotechnology, Atma Jaya Catholic University of Indonesia. This activity is considered exempt from the request for approval by the Organization Evaluation Council (IRB). In addition, food fermentation is a common practice in many Indonesian households, and they can safely produce traditional fermented foods over generations, such as ice (fermented cassava), tempe (fermented soybeans) and dadih (fermented buffalo milk). The risk of food-arising pathogen contamination can be minimized by following laboratory safety procedures and ensuring good hygiene and personal hygiene procedures (9, 10), all taught during training. The culture of launching a strain of lab-level food was prepared by the faculty in the laboratory according to the ASM BSL1 (10) guidelines. Other activities conducted in the outreach program are carried out by participants under the careful supervision of faculty and laboratory assistants. A number of control measures have been taken to maintain food safety and avoid failures of fermentation, such as sterile techniques and the application of appropriate fermentation temperature and time during cleaning, milk sterilization and fermentation. The success of yogurt fermentation is characterized by the production of lactic acid, which reduces pH, increases consistency and inhibits the development of spoiled and disease-causing microorganisms (2,8). After completing the sensory assessment of ready-made yogurt samples, participants were asked to record the pH and sensory properties of their own yogurt, assess the differences of each treatment and choose their preferred yogurt (Appendix 2). The average final pH after fermentation is 4.5. Participants also learned that different milks, changing their fat content, contributed to the consistency (texture) and oral feel of yogurt. The lower the fat content, the lower the the thinner the yogurt, except for skim milk made with 15% 15% milk powder and 4% sugar, which will increase the consistency of yogurt. Yogurt made from skim milk and sugar is the preferred yogurt due to its mild sour taste and moderate thickness. The addition of sugar before fermentation can increase sweetness and provide a mild acidic taste for yogurt as some sugars have been converted into lactic acid. Both types of starter cultures can be used to produce yogurt. The results also confirm the importance of milk sterilization and kitchen hygiene to achieve successful fermentation. A questionno table was provided to assess the interest of participants in learning activities (Annex 3). As most participants (87.5%) have never made yogurt at home, they find that these learning activities are very enjoyable and give them new knowledge and guidance that is easy to follow. Almost all participants (97%) even tried to recreate their own yogurt at home, reported to the trainers every week for a month. This outreach program is designed to train families from a bogor-based unsymist background to make yogurt at home. It is intended to introduce some basic concepts of microbiology, such as how to make good use of bacteria in food applications, how to control microbial growth through proper heat treatment and vaccination of starter cultures, and how to enrich the environment to support lab metabolism. The interest of those involved in these learning activities suggests that yogurt-making activity can serve as an effective positive learning tool for non-scientific participants, especially in relation to food fermentation. Moreover, experiments can be modified for university-level microbiology laboratory courses. Click here for more data files. (261K, pdf) The project is funded by the Institute for Research and Community Services (LPPM), Atma Jaya Catholic University of Indonesia. The authors claim that there is no conflict of interest.† a supple document is available at . Mazahreh AS, Ershidat OTM. Benefits of lactic acid bacteria in yogurt for digestive function and health. Pakistan J Nutr. 2009;8(9):1404–1410. doi: 10.3923/pjn.2009.1404.1410. We have to go. [Google Scholar] 2. Hartati AI, Pramono YB, Legowo AM. Lactose and reduced sugar levels, pH, and sourness of date flavor yogurt drink as probiotic drinks. J Appl Food Technol. 2012;1(1):1–3. [Google Scholar] 3. Legowo AM, Kusrahayu, Mulyani S. Milk Technology. University of Diponegoro; Semarang, Indonesia: 2009. [Google Scholar] 4. Yildiz F, editor. Development and production of yogurt and other functional dairy products. 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