Analysis of kefir information propagated in digital media

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Abstract

The amount of available information in the media grows continuously and, frequently, it does not have a basis in the scientific literature. In the area of food and nutrition, the contents are available on social media profiles, websites and blogs, which usually appoint some foods as "superfoods" – able of curing diseases or inhibiting their development – or, on the other hand, classifying other foods as the cause of damage to health. Kefir-based products can be classified in the first category, being considered a "superfood" by the media. Thus, the aim of this study is to search for information about kefir in digital media and to evaluate such information based on scientific articles. The contents were collected from 50 websites or blogs, using Google as a search tool. The data obtained were divided into 25 positive categories and 5 negative categories. One made a comparison with the scientific literature. Analyzing the information about kefir, the majority has a scientific basis, however, digital media put the research data in a superficial way, without clear information to readers.

Keywords: Kefir; fermented milk; media; health benefits.

1. Introduction

The consumption of natural products has been gaining prominence in nutrition and human health, among them, especially fermented milks produced by microorganisms through the fermentation of milk. These have therapeutic properties because in their composition they contain bacteria such as *Lactobacillus* and *Bifidobacterium* that have characteristics of probiotics. They are being used to promote effects on the health of the consumers, such as relief in lactose intolerance, action against pathogenic microorganisms, anticarcinogenic action and modulation of immune system, among other benefits [1, 2].

Among fermented milk products, kefir is a well-known food in many regions of the world and has become popular in Brazil. Kefir was originated in the Caucasus Mountains and it is traditionally consumed in the Czech Republic, Poland, Slovakia, Bulgaria and Hungary. Its characteristics are yellowish color, balanced and fermentative aroma. The flavor is acid but refreshing, and its texture is quite thick [3].

Kefir is a fermented product mainly obtained from milk through the action of kefir grains, which are symbiotic associations between microorganisms, including: yeasts, lactic acid and acetic acid bacteria coated with polysaccharides known as kefiran, which surrounds and maintains the kefir microbiota immobilized on the grains and ensuring its preservation. This can be fermented in goat, sheep, cow or buffalo milk, and also in soy extract. This drink is rich in carbon dioxide, vitamin B12 and polysaccharides that grant particular sensory characteristics. Lactic acid acts as a natural preservative, so kefir becomes a safe product for consumption [4-6].

This fermented milk differs from other because it has in its composition several microorganisms with potential probiotic capacity, that is, in its composition there are live microorganisms that, when administered in adequate doses, are able to improve the intestinal microbiota, consequently generating beneficial effects to the health of the consumer. Lactobacilli are present in greater quantities in kefir grains, however, the composition of the grains varies according to their origin, time of use, the substrate that will be used for fermentation and care in handling [7-9].

To be considered probiotics, microorganisms must survive stomach conditions and colonize the intestine - by adhering to the intestinal epithelium - and they must have the capacity to produce antimicrobial compounds and remain in the intestine when exposed to bile. In the food industry, the use of probiotic cultures with appropriate technological properties (a good multiplication), promoting appropriate sensory characteristics in the product. These microorganisms must be invariable during storage, and can thus be manipulated and added to food products without losing their functionality, resulting in products with adequate consistency and aroma [10].

Besides improving the intestinal flora, other benefits of kefir are: reduction of the effects of lactose intolerance, immunomodulation, defense against pathogenic microorganisms, cholesterol modulation, anticarcinogenic action, reduction of chronic disease risks and prevention of metabolic and gastrointestinal diseases, ischemic heart disease, allergies and hypertension [11, 12].

The consumption of kefir has been increasing around the world due to the promotion of well-being and health [7, 13]. Therefore, it is possible to find numerous articles about the benefits of kefir in wellbeing

area in digital media. However, none of this information goes through inspections before publishing and they may be vague, with few details or even flawed and with difficult comprehension to the ordinary readers, especially when is necessary to distinguish what is real and what is not well established [14].

Media plays an important role in society. Media can be understood as means of communication and information that include books, magazines, newspapers, press, radio, television, internet, cinema, posters, pamphlets and other means of disseminating information. The media is a way that helps in receiving and transmitting information, therefore, it helps in global communication. The way that the media uses to propagate its information, constitutes instruments that formulate and enable the individuals to create opinions, knowledge, values and norms. Media uses strategies that direct the message to the interlocutor, significantly influencing consumption, one of these consumptions can be the food habit that receives influences from lifestyle, cultural values and knowledge about food [15, 16].

Individuals in developing countries are the ones who seek the most for healthy food, with consumers paying more for foods that provide greater health benefits. Most consumers have been buying and looking for foods that have nutritional appeals like the ones that claim to have low fat levels, low cholesterol, and low sodium or originated from natural ingredients. However, when the nutritional table is presented, individuals have difficulties to understand it. According to the Comitê Gestor de Internet (Brazilian Internet Steering Committee), known as CGI, "health" is one of the topics that has received the most access, posts and sharing in recent times in Brazil. The search for health information is the second interest of Brazilians, this interest may be related to the fact that individuals have been concerned with health in recent years [17, 18].

The media induce the consumption of food, as the act of feeding involves both the individual's need and desire. Nowadays the media (mainly digital media) represents a great source of information, transmitting how people behave, dress, how they think and what they eat, constructing and deconstructing behaviors, including feeding habits [19, 20].

Due to the freedom present on the internet, any individual can produce information, therefore, health issues can be found on non-governmental and governmental websites, on social networks among patients and professionals. Thus, the dissemination of news may be incomplete, with little information, contradictory or incorrect, or else be correct and difficult to understand [17].

Therefore, considering that kefir is a probiotic potential and that it has several properties that confer health benefits and most consumers obtain information on digital media, the objective of this study is to compare the nutritional information found on digital media (websites and blogs) on kefir with the information presented in scientific articles.

2. Methodology

The study was carried out by collecting information found on digital media about kefir. Positive and negative points about kefir were analyzed in 50 digital sources, which are non-specialized websites and blogs, using general search tools, in Google. One excluded from the study the sales websites, advertisements and videos. After data collection, the information was tabulated, grouping them into categories (positive or negative), then the percentage of frequency with which each appeared was calculated

[21].

After collecting and systematizing the data, one carried out a bibliographic search in scientific studies in order to analyze whether the information found in the digital media about kefir has scientific basis or not. The articles for analysis were collected in the databases *Pubmed*, *Scientific Electronic Library Online* - *Scielo* and *Google Scholar* using the descriptors "kefir", "fermented milk", "media", "benefits" and "health", including articles published until the first semester of 2019. Finally, one performed an analysis on the contents found, identifying which information had and which did not have a scientific basis.

3. Results and Discussion

After the data collected on digital media, the information was grouped into 25 positive categories and 5 negative categories according to the information of the presence of kefir in the diet. **Table 1** lists the positive and negative categories that one considered in the study, with the frequency that each one appeared expressed in **Figures 1 and 2.**

Table 1. Information categories about kefir on digital media

Positive Categories	**Negative Categories**
1. Restores and balances the intestinal microbiota	1 - Contraindicated for people who have digestive disorders
2 - Benefits the immune system	2 - Not recommended for lactose intolerants
3 – Combat inflammatory process	3 - Liver overload, due to the presence of alcohol
4 – Antiallergic properties	4 - Not suitable for those who use medicines
5 – Reduction of lactose intolerance symptoms	5 - Not suitable for people with weakened immune system
6 – Reduction of cholesterol	
7 – Assists weight lost	
8 – Anticancer properties	
9 - Combat osteoporosis	
10 – Helps fighting against depression, insomnia and anxiety	
11 – Benefits digestion process	
12 – Antioxidant	
13 - Antibacterial, antifungal and antimicrobial properties	

14 – Improves nutrients absorption	
15 – Controls high blood pressure	
16 – Benefits vagina health	
17- Reduction of glycaemia	
18 – Maintains healthy skin, hair and nails	
19 – Reduces fat liver	
20 – Promotes sense of satiety	
21 – Prevents heart diseases	
22 – Helps healing process	
23 – Benefits people that use medicines	
24 – Helps combating Crohn's disease	
25 – Helps muscle construction due to large amount of protein	

Source: Authors, 2020.

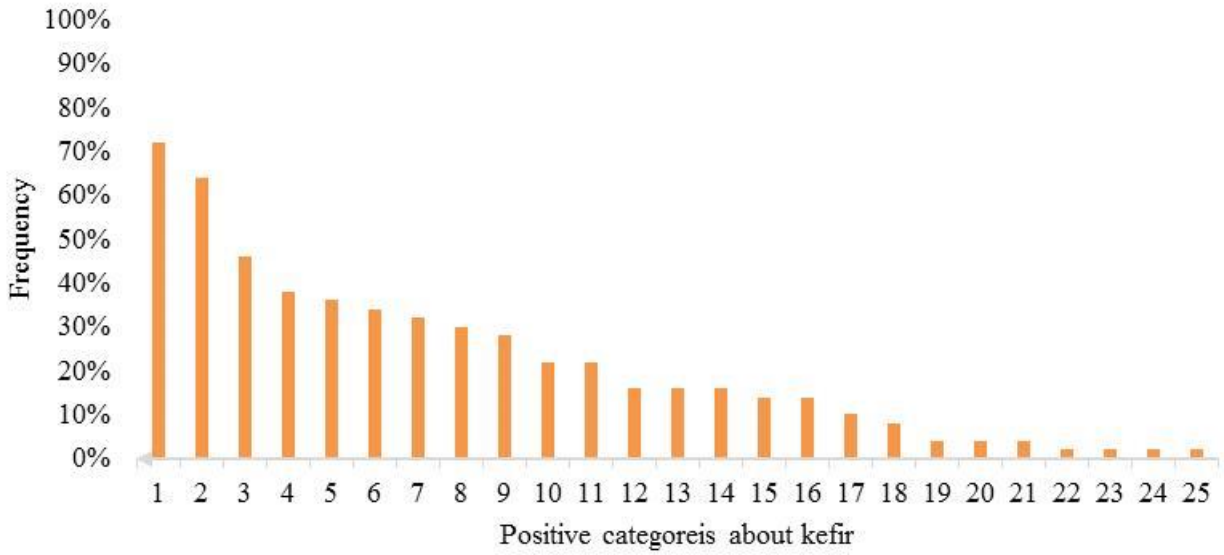

Figure 1. Frequency of positive categories about kefir information.
Source: Authors, 2020.

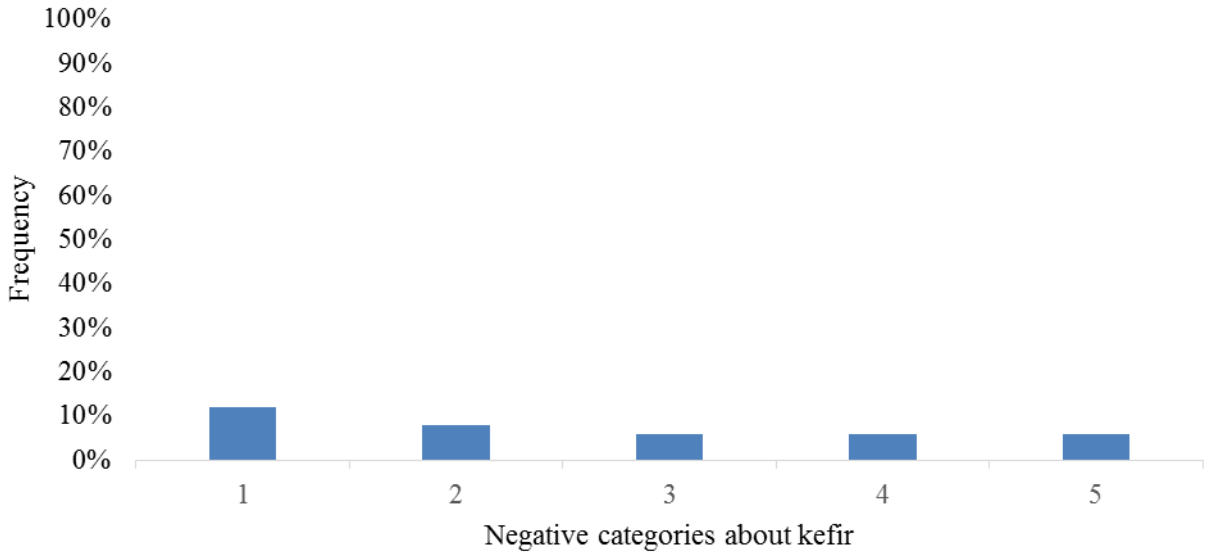

Figure 2. Frequency of positive categories about kefir information.
Source: Authors, 2020.

Based on the data found, it was possible to verify that in digital media (websites or blogs) there is more positive than negative nutritional information about kefir in food, both in the categorization and in the frequency that each information appears. The positive categories found from 1 to 8 and categories from 1 to 2 were the ones that appeared most frequently.

When analyzing the content, one can note that some information are contradictory, for example, there is a mention to kefir as helping the immune system versus not indicated for people with weakened immune systems; reducing symptoms of lactose intolerance *versus* not recommended for lactose intolerants; reduction of liver fat *versus* liver overload; bringing benefits to those who use medicines *versus* not indicated for those who use medicines; benefit digestion *versus* contraindicated for people who have digestive disorders. These discrepancies in the information already characterize a problem for individuals who seek information about kefir, because depending on the source that was consulted and the level of knowledge to discern the content, the reader may obtain erroneous information about the benefits or harms of kefir in the human diet.

The kefir has in its composition microorganisms that bring beneficial effects to the health of its consumers, effects that were highlighted in this study to compare information from digital media and data present in the scientific literature. However, the information found in the scientific literature indicates that studies with kefir present interventions in small groups and for short periods, with more studies on animals than on humans, and the study designs often lack clarity, causing difficulty to the reader in interpreting the data. In addition, the conflicts found in the study may be due to the type of stump used, the fermentation conditions to which the product was submitted, the lack of standardization in kefir cultures and the dose that was administered; so there are many factors that can affect the results. Therefore, it is necessary to carry out well-designed studies on this topic to a better comprehension of kefir effects.

The categories that appeared most frequently were compared with some studies found in the scientific literature.

3.1 Restores and balances the intestinal microbiota

A study was conducted on 20 patients with functional constipation. They were divided into two groups: 10 patients in the normal transit group (NT) and 10 patients in the slow transit group (ST). All patients received 500 mL/day of kefir for 4 weeks. Stool frequency, stool consistency, degree of effort and laxative consumption were registered in the patients' diary [22].

Another study was carried out with 45 patients, 23 men and 22 women. They were divided into two groups: 25 for the treatment group for Inflammatory Bowel Disease and 20 for the control group, with the aim of analyzing the effects of kefir consumption on fecal microflora and on symptoms of patients with inflammatory bowel disease. Patients were given 400 mL/day of kefir, twice daily for 4 weeks. The control group did not consume placebo because it was not possible to prepare a product similar to kefir. Yogurts are similar to kefir, however they also have *Lactobacillus* which can affect the microbiota [23].

In the study developed by Erdogan et al. [24] 30 mice were divided into a control group (CK), which received a placebo; kefir group (GK) and kefir group of initial culture (SK). The animals received 0.3 mL/day of kefir via oral gavage for 15 days and 0.3 mL of sterile water.

In a study carried out with 125 children aged 1 to 5 years, 61 children in the active group received 150 mL of kefir, and 64 children in the placebo group received 150 mL of heat-treated drink to damage all *Lactobacillus* cultures. Both products had a lemon flavor and the same texture and appearance. These children used antibiotic drugs to treat respiratory tract infections. This study lasted for 2 weeks and children could not consume another type of dairy product, neither fermented nor probiotics [25].

After collecting the data, one analyzed that the information on this topic presented in digital media appeared more frequently, in a percentage of 72% in our research. The scientific literature reveal some studies that show that kefir is effective in restoring and balancing the intestinal flora, showing that the information present in the digital media has a scientific basis. In the study developed by Turan et al. [22], kefir significantly treated constipation, and the patients showed improvement in stool consistency and less effort in bowel movements. In the study conducted by Yilmaz, Dollar & Ozipinar [23], the objective was to analyze whether the kefir fermentation was effective in Inflammatory Bowel Disease. The individuals undergoing treatment obtained a reduction in pro inflammatory factors; in addition, symptoms such as swelling were reduced. According to Erdogan et al. [24], the consumption of kefir provided an increase in lactic acid bacteria (LAB) in the intestine, in addition to surviving stomach acid, allowing improvement in the intestinal microbiota. On the other hand, in the study developed by Merenstein et al. [25], when analyzing whether kefir consumption would reduce diarrhea in children who use antibiotics, one found that there were no improvements in the symptoms of diarrhea, vomiting and fever. In this study, kefir was not effective as a treatment. adjuvant for individuals using antibiotics.

3.2 Benefits to immune system

Medrano et al. [26] conducted a study on the effect of Kefiran on immune cells. In this research, 6 to 8-week-old mice were divided into groups (control and experimental) of 5 to 7 animals. One administrated the international diet and water *ad libitum* to the control group and for the experimental group, Kefiran (300 mg/L) was administered, with 0.9 to 1.2 mg/day of kefiran for each mouse, and water *ad libitum*. The experiment lasted for 7 days.

Another study was carried out with 5 groups composed of 3 healthy women. For 4 days, they received the following diets: K (control group), P1 (treatment group with 0.5% concentration kefir), P2 (treatment group with 1% concentration kefir), P3 (kefir treatment group of 2% concentration), P4 (kefir treatment group of 5% concentration). The results were examined by the percentage of cells T CD4 + T CD8 + IFN_{-Y}, IL-4 and levels of IL-2, IL-10 [27].

In our study, we analyzed that the media has information about the topic "kefir helps the Immune System" with a frequency of 64%. Medrano et al. [26] found that the consumption of kefiran is an efficient immunomodulator capable of improving the immune response by increasing the immunoglobulin-IgA cells, which is an antibody that acts to protect against the proliferation of viruses and bacteria. Another study by Wisudanti [27] showed that there was an increase in the stimulation of Interleukin - IL-10, which has the function of inhibiting inflammatory factors, in addition to assisting in the secretion of pro-inflammatory cytokines IFN_{-Y} and IL-4. These results show that kefir has the ability to modify the balance of immune cells.

3.3 Combats inflammatory processes

Chen et al. [28] developed a study using female mice, (group 1) with 6 animals, and (group 2) with 8 animals. Group 1 received 10^7 *Lactobacilus Kefiranofaciens* M1, another group received 10^8 *Lactobacilus Kefiranofaciens* M1 daily for 14 days, and in the last 7 days, 2% Dextran Sodium Sulfate (DSS) was added to the water to induce colitis.

Another study was carried out with healthy, 4-week-old male mice, with the objective of evaluating the properties of kefir together with changes in the gut microbiota. The animals were divided into 2 groups of 12 animals each, the LK group received 10^8 CFU of *Lactobacilus de kefiri* via gavage, and the PBS (control group) received the placebo [29].

In the study developed by Chen et al. [28], the animals that received the treatment had their intestinal barrier restored, in addition to reducing pro-inflammatory factors by increasing the Interleukin IL-10. In another study by Carasi et al. [29], the treatment with the probiotic increased the Immunoglobulin - IgA in the feces, reducing pro-inflammatory mediators, inducing Interleukin - IL-6. Analyzed samples collected from the ileum and the colon demonstrated anti-inflammatory effects. Therefore, both studies show that kefir is important in the regulation of intestinal homeostasis. On websites and blogs, the combat against the inflammatory process appeared in 46% of the analyzed data.

3.4 Antiallergic properties

A study carried out with mice, with serological tracking of similar respiratory pathogens, the mice were sensitized by ovalbumin via air, which was emulsified in 2 mg of aluminum hydroxide. Three times every 24 hours, 50mg of kefir was administered intragastrically. The levels of Interleukins IL-4, IL-13 and levels of Immunoglobulin E - IgE were reduced [30].

Another research performed by Hong et al. [31], with the objective of evaluating the antiallergic properties of kefir, used mice that received 20mg of ovalbumin intraperitoneally. In addition to receiving a bottle of kefir with 1.5 x 10^7, 3 x10^7, 6 x10^7 UFC/day.

Theme 4 appeared in our study in 38% of searches on digital media. One can see that, in the study

performed by Lee et al. [30], the consumption of kefir inhibited inflammatory cells, in addition to improving the airway that was sensitized by ovalbumin. In the study by Hong et al. [31], kefir inhibited the production of immunoglobulin-IgE in response to ovalbumin, playing an important role in antiallergic activity.

3.5 Reduction of lactose intolerance symptoms

Vrese et al. [32] conducted a study with the objective of evaluating the lactose present in kefir fermentations. The research used 10 pigs fed with kefir and an increase in plasma galactose was related.

Another study with 15 participants, 8 men and 7 women with lactose intolerance, consumed 5 different types of dairy products (plain kefir, raspberry flavored kefir, plain yogurt and raspberry flavored yogurt) administered on 5 different occasions. The tests were administered to the participants in random orders [33].

In the bibliographic reviews carried out by Rosa et al. [34] and by Ahmed et al. [35], one reported that there are only a few studies on kefir in lactose intolerance. They show that after the fermentation period, there is a reduction in lactose due to enzymes that are released by the microorganisms present in the kefir grains. In the present study, no recent research on this topic was found. In the research carried out by Vrese et al. [32] kefir administered to pigs favored intestinal hydrolysis of lactose due to the increase in galactose and consequently the enzyme p-galactosidase used in the break of lactose. Another study by Hertzler & Clancy [33] showed that kefir and yogurt are supported by patients who have lactose intolerance, as it has a reduction in hydrogen, in addition to decreasing of individuals' flatulence (around 50 to 70%), when compared to milk. Some sites and blogs show on their pages that kefir can be a good association for those who have lactose intolerance. This information was present in 34% of performed searches.

3.6 Reduction of cholesterol

Huang et al. [36] developed a study with the objective of evaluating the hypocholesterolemic activity of *Lactobacillus plantarum* isolated from kefir grain. Twenty mice were fed with diets rich in cholesterol. They were divided into 2 groups: the group 1 received a high cholesterol diet, and the group 2 received a high cholesterol diet plus *Lactobacillus plantarum* isolated from kefir during 4 weeks.

Zheng et al. [37] evaluated the functional properties of lactic acid bacteria isolated from kefir grains. They used 40 mice divided into 4 groups of 10 animals each. The group 1 (control) received a high cholesterol diet plus placebo; group 2 (LA15) received a high cholesterol diet plus *Lactobacilus acidophilus*; group 3 (B23) received a high cholesterol diet plus *Lactobacilus plantarum;* group 4 (D17) received a diet rich in cholesterol plus *Lactobacilus kefiri* for 28 days.

Another study compared the effect of kefir and banana pulp on the serum levels of total cholesterol, High Density Lipoprotein-HDL, Low Density Lipoprotein-LDL and triglycerides. This study used 30 mice divided into 5 groups. During 21 days, these animals received hypercholesterolemic diets, except the control group. The animals received the following diets: GC group received a standard diet; HIP group received a hypercholesterolemic diet;, F group F received a hypercholesterolemic diet plus 1% banana peel flour and 7% banana pulp flour; Q group received a hypercholesterolemic diet plus kefir by oral infusion, and the group FQ received a hypercholesterolemic diet plus 1% banana peel flour and 7% banana pulp

flour, plus kefir 1.5 mL/animal [38].

Topic 6 was present in 34% of the digital media surveyed, and the studies above show that kefir has a beneficial effect in reducing cholesterol levels. Huang et al. [36] observed a significant reduction in total cholesterol levels in mice fed with a diet rich in *Lactobacillus plantarum*, in addition, there were decreasing liver fat and triglycerides. Zheng et al. [37] analyzed the properties of kefir fermented with different strains showed that all kefir cultures have the capacity and reduction of total cholesterol, triglycerides and Low Density Lipoproteins (LDL). The animals also showed an increase in High Lipoprotein Density (HDL), and the levels of fecal cholesterol and bile acid also increased in the feces of these animals after supplementation with kefir. This shows that kefir can be used as a probiotic potential. In the study developed by Angelis-Pereira et al. [38], supplementing animals with bananas did not affect HDL and LDL cholesterol levels, but reduced triglyceride levels by 22%. However, kefir showed a reduction in levels of total cholesterol and low-density lipoproteins and triglycerides, increasing HDL levels. Animals that received diets high in cholesterol showed a reduction in total cholesterol, in addition to decreasing triglycerides compared to the control group, such results show that kefir can have a beneficial effect in preventing or reducing these diseases.

3.7 Assists weight loss

A study was carried out with 75 women aged 25 to 45 years. The participants were divided into 3 groups: group 1 (control) received a diet of two portions of dairy products with low fat content, in addition to energy maintenance foods; group 2 (milk) and group 3 (kefir), received a weight maintenance diet containing two additional servings/day of skimmed milk products or commercial kefir drink respectively. Only 58 people completed the study for 8 weeks [39].

Kim et al. [40] conducted a study to evaluate the effects of kefir on obesity and liver disease. Twenty mice were divided into two groups, and both received weekly animal feed; the kefir group received 0.2 mL of kefir orally, while the other received 0.2 mL of milk for 12 weeks.

Another study, carried out by Bourrie et al. [41], aimed to evaluate kefir's ability to control weight, using 56 mice distributed in groups. The control group(LDF) received a low-fat diet and standard rodent feed. The other groups (HDF, HDF + ICK, HDF + IR9, HDF + IR10, HDF + Ger) received a high-fat diet, which contained 40% fat supplemented with 1.25% cholesterol by weight, and kefir was administered. The study lasted 12 weeks.

Fathi et al. [39] found that both showed a reduction in waist circumference, weight and body mass index, so this shows that there were no differences between them. However, the study carried out by Kim et al. [40] found that animals supplemented with kefir reduced weight and pro-inflammatory markers, showed small accumulations of fat around the liver and improving liver damage; thus kefir showed an improvement in obesity and liver disease. Bourrie et al. [41] observed in their study that animals fed with kefir showed less weight gain, reduced levels of total cholesterol and triglycerides. In addition, they obtained evidences that kefir modulated the intestinal microbiota, which shows that this product has the capacity to improve the dysfunction associated with obesity. As this theme appears in 32% of the digital media researched, one can analyze the veracity of this information as explained above based on scientific sources.

3.8 Anticancer properties

A study with the objective of evaluating if kefir would be able to prevent pre-neoplastic lesions induced by azoxymethane (AOM) used 18 mice. The animals were divided into 3 groups of 6 animals: control group, disease group and treatment group. The control group and the treatment group received respectively 5 mL/kg of 0.9% saline solution and kefir solution once a day. For the disease group, azoxymethane (AOM) was diluted in 0.9% saline solution and injected into the animals once a week at 15 mg/kg for 2 weeks and more kefir administered via gavage. The study lasted 8 weeks [42].

Reis et al. [43] developed a study with the objective of evaluating the effect of daily kefir consumption in reducing the development of pre-neoplastic lesions in the colon of rats. They used 30 animals divided into 3 groups. In the first five weeks for the animals in the control group, 1 ml of distilled water was administered; the milk group received 1 ml of pasteurized whole milk, and the kefir group received 1 ml of milk kefir, all via gavage. In the second moment, the rats were submitted to the induction of pre-neoplastic lesions with 1,2-dimethylhydrazine. After the post-induction phase, which lasted 15 weeks, the animals continued to receive their respective treatments. The duration was 20 weeks.

In the study developed by Melo et al. [42], they showed that animals supplemented with kefir reduced the foci of aberrant crypts by 43% in height and 20% in width, proving to be effective in reducing aberrant crypts. Another study by Reis et al. [43] evaluated that kefir has the capacity to reduce 36.7% of the incidence of outbreaks of aberrant crypts in the colon of animals supplemented with the product, increasing the catalase antioxidant activity in the colon and reducing the concentration of fatty acids in the cecum feces. . These two studies show that kefir has an anticarcinogenic action. In the survey, we analyzed that this information appears in 30% of the sources.

3.9 Other studies

In a study by Ostadrahimi et al. [44] with the objective of determining the effect of kefir on the control of glucose and lipid profile of patients with Diabetes Mellitus, sixty diabetic patients aged 35 to 65 years participated in the research. They were divided into 2 groups: the kefir group received 600 ml/day of fermented milk by kefir, and the control group received 600 mL/day of traditional fermented milk, both for 8 weeks. One collected blood samples and fasting glycaemia tests, HbA1C, triglycerides, total cholesterol and High Density Lipoprotein-HDL and Low Density Lipoprotein-LDL.

Rosa et al. [45] carried out a study with the objective of verifying the toxicity of kefir, administered orally in normal doses and overdose, in addition to evaluating parameters of body weight, chemical blood hematology, bacterial translocation and integrity of the intestinal mucosa. Three groups of six animals were divided; control group received 0.7 mL/day of water; kefir group received 0.7 mL/day of kefir and Hkefir group received 3.5 mL/day of kefir administrated by tube-feeding for 4 weeks.

Another study aimed to verify the antimicrobial activity of kefir against pathogenic microorganisms. Twenty strains of lactic bacteria were isolated and their inhibition capacity was evaluated through the biocines action. The strains of *Escherichia coli*, *Staphylococcus aureus* and *Salmonella typhimurium*, were grown in soy broth. Antimicrobial activity was evaluated by the formation or not of an inhibition zone around the cavity [46].

Monteiro [47] carried out a study that aimed to analyze the effect of kefir on endothelial dysfunction

in rats with renovascular hypertension. The animals were divided into 3 groups: group 2R1C-kefir received kefir in the dose of 0.3 mL/100g; two other groups (Sham and 2R1C) also called as "vehicle groups" received whole UHT milk, all received a gavage diet for 60 days.

Ostadrahimi et al. [44] analyzed that glycated hemoglobin (HbA1C) significantly decreased in the probiotic group compared to the control group. The levels of serum triglycerides and total cholesterol, LDL and HDL did not show significant differences among the groups after the intervention. This shows that the kefir can be used as an adjunct in the treatment of diabetes. In the analysis carried out on digital media, 10% of the sources presented this information. Rosa et al. [45] analyzed in their study that the administration of kefir in normal doses and overdose did not affect animals, body weight, hematological indicators, blood chemistry and potential pathogenicity in tissues, demonstrating that the consumption of kefir in normal doses and overdose is safe, in addition to reducing cholesterol levels and improving the intestinal mucosa of animals. In the research conducted on digital media, this topic did not appear on websites and blogs, however in scientific literature, the studies show that kefir does not present any harm in overdoses.

When analyzing kefir antimicrobial activity, Tussolini et al. [45] found that 90% of 20 strains had antimicrobial action against the *Staphylococcus aureus* strain; the action against *Salmonella typhimurium* was 85%, and the action of *Escherichia coli* 95%. Therefore, it was possible to analyze that strains of lactic acid bacteria isolated from kefir grains have the capacity to inhibit pathogenic microorganisms. In our study, the antimicrobial capacity appeared in 16% of the evaluated digital material. Monteiro [47], when analyzing the effect of kefir with hypertensive rats, showed that the group under treatment with kefir obtained a reduction in mean arterial pressure. In addition to decreasing the activity of the enzyme ECA - Angiotensin-converting enzyme, improving oxidative stress. Among the analyzed sources, 14% of them reveal that kefir controls hypertension. The scientific literature above demonstrates the veracity of the information.

4. Conclusion

From the comparison made between the most frequent data obtained in digital media and the data taken from the scientific literature, it was possible to analyze that there is a large amount of positive information about kefir. The majority of the categories that appeared most often have recent articles on the beneficial effects of kefir on health. Of the 17 categories with less frequency such as "helps combating osteoporosis", "benefits digestion process", "acts as an antioxidant", "antibacterial, antifungal and antimicrobial properties", "improves nutrients absorption ", "controls high blood pressure", "benefits vaginal health", "reduction of glycaemia", "reduction of fat liver", "prevents heart diseases", "helps healing process" and "helps combating Crohn's disease", appeared in the scientific literature.

Categories such as "maintains healthy skin, hair and nails", "promotes sense of satiety", "benefits people who use medicines", "helps muscle construction due to large amount of protein", did not appear in the scientific literature, showing that the digital media analyzed do not have a scientific basis for such information, and can therefore confuse consumers, who seek to be informed through this media.

Therefore, in what was analyzed, we found that there are not many myths in the information disseminated in digital media regarding the general consumption of kefir. However, there are several cultures of kefir used by the studies, which the websites and blogs do not specify for the reading public,

not indicating, therefore, which strain should be used to obtain the related results, making the passage of the contents to the electronic media superficially, missing the scientific content, unclear to the lay public.

However, people who seek to use this product should search scientific information or professionals who can help in the best way to consume them. They will clarify how the consumption should be, the ideal amount and how to handle the product properly.

5. References

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