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Detection of serum and salivary IgE and IgG_1 immunoglobulins specific for diagnosis of food allergy

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Abstract

Given the growing incidence and prevalence of life-threatening food allergies, health concerns have raised new perspectives for *in vivo* and *in vitro* diagnostic methodologies, pointing to saliva as a promising material, already used to diagnose other pathologies. Based on the above considerations, this study aimed to verify the possible use of saliva for the detection of IgE and IgG_1 in the diagnosis of food allergy. This was a randomized, cross-sectional clinical study with a quantitative approach, developed at a hospital referral center in allergy in the state of Ceará, from January to July 2015. The sample consisted of 36 children of both sexes, aged between 1 and 60 months, with a diagnosis of cow's milk protein allergy (CMPA) by the RAST test. Children hospitalized or under immunosuppressive drugs were excluded from the study. Serum and saliva samples of the participants were collected and subsequently subjected to the indirect immunoenzymatic assay (ELISA) for the detection of specific serum and salivary immunoglobulins for food: corn, papaya, cow's milk, egg white, wheat, soybeans, peanuts, nuts, kiwi, cacao, fish, shrimp, bananas and tomatoes. For comparison of serum and saliva results, the T-test of independent samples and Mann-Whitney were adopted, for samples with normal and non-normal distribution respectively. A confidence interval of 95% was adopted for significant results. It was observed that 100% (n = 36) of the participants presented cow's milk allergy through the indirect ELISA, detecting IgE or IgG_1 in serum and saliva. When serum IgE and IgG_1 concentrations were compared, there was no statistical difference ($p > 0.05$) in 12 of the 14 foods evaluated. The same amount (n = 12) of non-significant differences ($p > 0.05$) was observed in the comparison of the 14 foods under IgE and IgG_1 contractions in saliva. In the verification of the average values of IgE present in the serum and saliva of the foods, only cow's milk, fish and papaya showed statistically significant differences ($p < 0.05$). Of the total food evaluated, only the average levels of IgG_1 present in serum and saliva showed a significant value ($p < 0.05$) in banana and tomato. These findings indicate that the detection of IgE and IgG_1 in saliva proves to be as efficient as in the serum. The use of the salivary technique for use in the diagnosis of food allergy is suggested.

Introduction

Food allergy (FA) is an adverse health effect due to an immune response that occurs reproducibly after exposure to a given food [1]. Allergies have an impact on the health of the patient, cause expenses for being a selective disease, imposing on their patients certain specific eating behaviors and other expenses with diagnosis and treatment [2].

Thus, FA comes with significant social and economic impact, worrying the scientific community and health professionals. Currently, food allergy is present in more than 220 million people in the world [3]. Therefore, approximately 8% of the infant population and 5% of the adult world population present allergy to at least one food [4].

As it is a larger child population, in recent years new perspectives in the diagnosis for food allergy *in vivo* and *in vitro* have been elucidated, evaluating not only the immunological mechanism with the presence of IgE antibodies, but also the design of the clinical phenotype of food hypersensitivity reactions, thus ensuring the diagnosis of reliable allergy [3].

However, the methods currently available to diagnose FA are still invasive, causing discomfort to the patient, often present high costs, and are restricted to one food per test. In addition, the test considered gold standard in diagnosis, requires hospital environment and trained staff, and may trigger life-threatening reaction, leading to anaphylactic shock in the patient. Moreover, this variety of methods only evaluates the presence of IgE class specific antigen antibodies [5].

In addition to the existence of diagnostic tests through the detection of IgE, other immunoglobulins are also being studied for this purpose. Mention may be made of food antigen-specific IgG_1 and IgG_4 panels, as these antibodies have been cited by some authors as a possible alternative for the diagnostic of FA, but currently only IgG_1 is being further emphasized by the fact that IgG_4 does not have specific receptors in the cells, which prevents the formation of the clinical reaction of food hypersensitivity [6].

Among the samples investigated for use in the diagnosis of FA [7], saliva has been pointed out by researchers, due to the significant presence of secretory IgA, IgG and IgM immunoglobulins [8] and already have been used for the diagnosis of HIV (human immunodeficiency virus), cancer, tuberculosis and *Helicobacter Pylori* infection [9].

The racional behind the technique used in this study is that some antibody associated with allergy found in the bloodstream can also be found in the saliva, thus allowing them to be identified through immunologycal testing [10,11]. In view of the above stated, this study aimed to verify the possibility of using saliva to detect IgG_1 for the diagnosis of food allergy.

Material and methods

Study participants and sample

This is a case-control study, cross-sectional and quantitative approach, with data collection performed at the food allergy outpatient clinic of a Children's Hospital of reference in Fortaleza / CE and analyzes in the Laboratory of Molecular Biology of the State University of Ceará.

The study comprised of samples from a group of children from 0 to 5 years of age, that attended at the food allergy outpatient clinic, diagnosed with cow's milk protein allergy (CMPA) by the gastro-pediatrician through the RAST [12] test and the anamnesis (Supplementary 1). Only after, those responsible who agreed to participate signed the written informed consent form (WICF) and answered a questionnaire, the collection of serum and saliva were performed. Children hospitalized or taking immunosuppressive drugs were excluded from the study.

For the control group of the study, blood and saliva were collected from healthy children under routine outpatient pediatric care, having the signature of the WICF by their guardians and responses to the food research questionnaire to confirm the absence of allergy to the foods tested.

In order to compose the serum and saliva samples, 36 children, allergic to cow's milk protein (experimental group), were selected by the inclusion criteria. The ELISA test was performed in 56 children to investigate the presence of IgE and IgG_1 in serum and saliva samples, firstly, against cow's milk proteins and posteriorly the other 13 foods, totaling 14 foods studied.

Ethical and legal aspects

The study was submitted and approved by the Ethics Committee of the State University of Ceará (UECE)–process n˚ 26108713.6.0000.5534, following all the recommendations of Resolution 466 of the Brazilian National Health Council of December 12, 2012 for research involving human beings.

Sample preparation

Three milliliters of blood were collected from both groups, stored in heparin-free tubes and centrifuged for 10 minutes at 8,000 x g, for serum withdrawal and storage at -20˚ C for further analysis. The total saliva was collected in an unstimulated way in the morning, not requiring fasting, through a Swab for collecting saliva (salivette), which was placed in a polypropylene tube and kept on ice. The samples were processed by adapting the Hu et al., (2010) [13] model, where the samples were centrifuged at 8,000 x g for 5 minutes at 4˚ C. After centrifugation, the supernatants were removed and stored at -20˚C until analysis.

Obtaining food extracts

The extracts were obtained from fresh foods: pasteurized skimmed cow's milk, ear of corn (*Zea mays*), dehydrated soybeans *(Glycine max)*, peanuts in shell unsalted (*Arachis hypogaea L.*), cashew nut (*Anacardium occidentale*), egg white *(Gallus gallus domesticus)*, papaya *(Carica papaya)*, kiwi *(Actinidia deliciosa)*, fish *(Cynoscion acoupa)*, wheat *(Triticum aestivum)*, *banana (Musa cavendishi)*, tomato *(Solanum lycopersicum)*, cocoa *(Theobroma cacao)*, shrimp *(Litopenaeus vannamei)*.

To obtain the extracts, the foods were triturated with distilled water and then centrifuged at 4˚ C for 30 minutes at 10,000 x g. The supernatant was removed and mixed with a solution of 10% Acetone (LAMY et al., 2012), diluted 1:3 and incubated for 2h at -20˚C. This solution was centrifuged another 2 times at 4˚C for 30 minutes with Acetone at 10,000 x g, for pellet formation and diluted with distilled water for quantification by the Bradford method (1976) (CARVALHO et al., 2004), with bovine serum albumin (BSA) as the standard (Table 1) and characterization of the proteins by 15% SDS-PAGE.

ELISA Indirect (Enzyme linked immunosorbent assay)

Patients' serum and saliva were submitted to the indirect ELISA test (Enzyme Linked Immunosorbent Assay) for detection of IgE and IgG_1, placed on individual plaques. For this test, the plates (U96-POLYSORP-NUNC-IMMUNO PLATE BATCH 016181) of each patient were sensitized with 2μg/well of food (cow's milk, fish, shrimp, egg, peanut, nut, soy, wheat, corn, papaya, tomato, kiwi, banana and cocoa), diluted in 50 mM sodium carbonate buffer pH 9.6, so that each well was coated with 100 μL of the final solution.

Table 1. Quantification of total proteins by the method of Bradford (1976).

Food	Amount	Protein concentration (mg/mL)
Pasteurized Skimmed Milk	50mL	1.20
Shrimp*	40g	0.16
Egg White*	50g	0.63
Kiwi*	365g	0.33
Wheat (flour)	60g	15.90
Soybean (PTN)	60g	15.40
Corn*	100g	1.60
Cashew nut	30g	2.50
Peanut	50g	1.70
Cocoa powder	55g	5.60
Fish (yellow hake fillet) *	60g	14.47
Tomato*	590g	0.17
Banana*	250g	0.39
Papaya*	510g	0.14

* Fresh Food

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For each food, 4 plates were used, divided in Saliva IgE, Serum IgE, Saliva IgG1 and Serum IgG1, each consisting of duplicated samples, positive, negative and white control. After sensitization with the antigens, the plates were incubated for 18 h at a temperature of 4˚C and washed 3 times with PBS-Tween 0.05%, for further blocking with PBS gelatin at 1% and incubated again for 2 hours. After further washing with PBS-Tween 0.05%, each well received serum or saliva from the experimental group diluted 1:100 and incubated for 2 hours at 37˚ C under gentle shaking. Again the plates were washed 3 times with PBS-Tween 0.05% and added antibodies conjugated to anti-human IgE peroxidase (Sigma A9667) at a dilution of 1:2000 or anti-human IgG1 (Sigma B6775) in 1:1000, incubated under gentle shaking for 1 hour. After washing, the plates received 100 μL/well of tetramethylbenzidine solution (TMB) then the absorbance was measured at 605 nm with an automatic ELISA reader.

For the analysis of the results, the absorbance averages of the blood samples and saliva of the control group were made, which served to establish the cutoff point in the experimental group, calculated and presented as three times the standard deviation of the mean of the negatives [14]. The values found above cutoff were considered positive for food allergy.

Statistical analysis

The statistical analyzes of this work were carried out using the software R version 3.4.1. Data were expressed as measures of central tendency and dispersion. Also presented error bar graphs with mean and confidence interval of 95%. Normality of the variables was tested using the Kolmogorov-Smirnov test and homogeneity of variances by the Levene test. For the comparison of means, Student's t-test was used for independent samples, when the data were normal and homogeneous, and the Mann-Whitney test, when the data were non-normal and non-homogeneous. For the comparison between more than two means, when the data were presented normal and homogeneous the test of ANOVA was used, and if not, the Kruskal-Wallis test, which were followed by the Tukey post-test. For the comparison of the mean values of the variables with the reference value, Student's t-test was used for one sample. The results were considered significant with values of $p < 0.05$.

Results

The quantification of the total proteins of the 14 foods in the study was performed by the Bradford method (1976), presented in Table 1, and the electrophoretic profile for protein characterization were obtained by SDS-PAGE, which revealed the migration of protein fractions with an estimated molecular mass in the range of < 14.4 and < 97.0 kDa, which can be observed in Fig 1.

The ELISA test showed a 100% level in both specificity and sensitivity compared to the RAST test. As shown in Table 2, in all the patients that presented allergy to cow's milk protein, IgE and IgG_1 was detected in serum and in saliva for the other foods studied, by the ELISA test. On the other hand, no reaction was observed with the control group.

After evaluating the test with cow's milk protein, it was in the interest of the study to verify if children allergic to cow's milk protein could present allergy to other foods. The fish, shrimp, egg white, soybean, wheat, peanut, brown, corn, papaya, banana, kiwi, tomato and cocoa proteins were tested in the experimental group, 100% of the sample was also allergic to fish (Table 2). There was a higher prevalence of allergy for ELISA-tested patients in shrimp followed by wheat, egg white, soy, brown, peanut, corn, banana, papaya, tomato, kiwi and cocoa, which presented the lowest percentage of allergic sensitivity, that the animal protein group was the most sensitive when compared to the other groups.

When the means of IgE and IgG_1 concentrations in serum were compared, all foods had no statistical difference ($p > 0.05$), except for cow's milk and fish ($p < 0.001$; $p < 0.010$), respectively (Table 3).

When comparing the mean of IgE and IgG_1 concentrations in saliva, all foods had no statistical difference ($p > 0.05$), except for cow's milk and tomato, which presented a difference ($p < 0.001$, $p < 0.003$) (Table 4).

When analyzing the mean of IgE concentration against shrimp, egg, soybeans, wheat, chestnut, peanut, kiwi, banana, tomato and cocoa; no significantly difference between Serum and

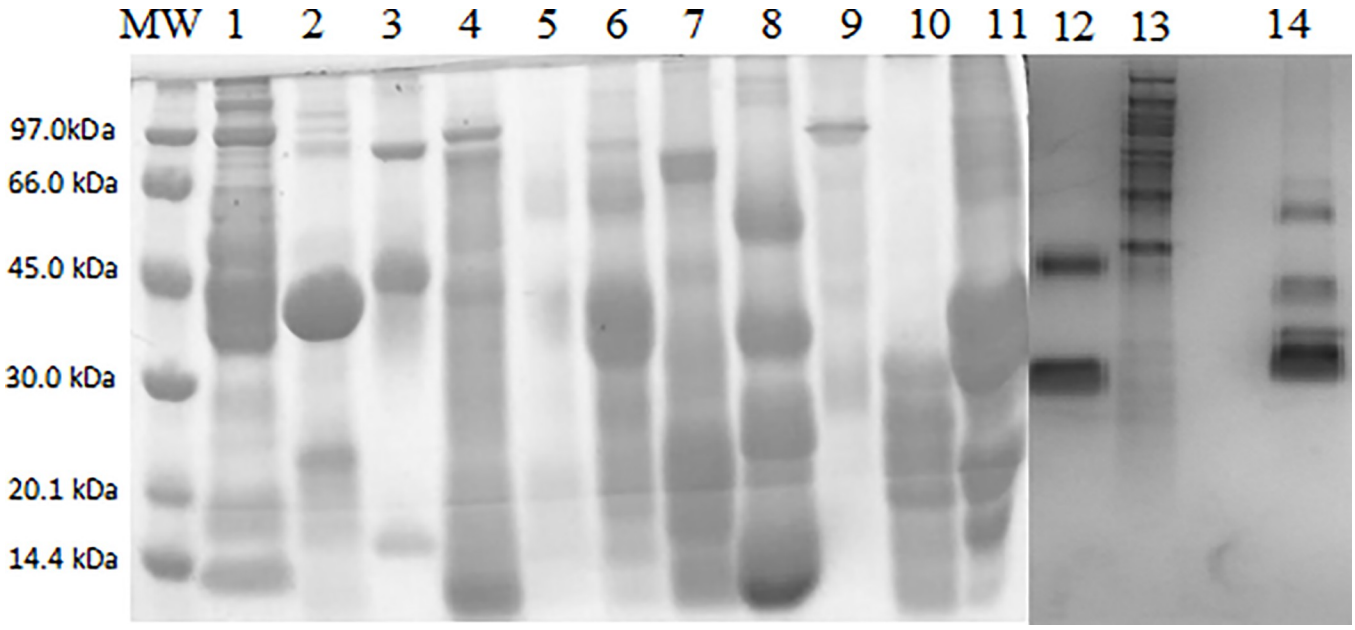


Fig 1. Characterization of total proteins demonstrated in 15% SDS-PAGE stained in Coomassie blue. MW. Molecular Weight, 1. Fish, 2. Shrimp, 3. Clear Egg, 4. Corn, 5. Wheat, 6. Soy, 7. Peanut, 8. Chestnut, 9. Papaya, 10. Kiwi, 11. Milk of cow, 12. Banana, 13. Tomato and 14. Cocoa.

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Table 2. Distribution of IgE and IgG_1 present in serum and saliva of allergic children for each food tested by ELISA.

	Serum		Saliva	
	IgE (n)	IgG_1 (n)	IgE (n)	IgG_1 (n)
Cow milk	100% (36)	100% (36)	100% (36)	100% (36)
Fish	100% (36)	100% (36)	100% (36)	100% (36)
Shrimp	67% (24)	64% (23)	67% (24)	80% (29)
Egg white	39% (14)	61% (22)	55% (20)	44% (16)
Soy	52% (18)	55% (20)	55% (20)	53% (19)
Wheat	55% (20)	61% (22)	64% (23)	67% (24)
Cashew nut	39% (14)	47% (17)	30% (11)	53% (19)
Peanut	36% (13)	39% (14)	25% (9)	25% (9)
Cocoa	11% (4)	3% (1)	6% (2)	6% (2)
Corn	36% (13)	25% (9)	39% (14)	25% (9)
Papaya	25% (9)	58% (21)	16% (6)	16% (6)
Kiwi	8% (3)	19% (7)	19% (7)	11% (4)
Banana	25% (9)	30% (11)	22% (8)	36% (13)
Tomato	11% (4)	16% (6)	22% (8)	39% (14)

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Saliva was found ($p > 0.05$). However, the mean of IgE concentration against cow's milk and papaya in serum was significantly lower than in Saliva ($p < 0.05$). In addition, the mean of IgE concentration against fish and corn in serum was significantly higher than in Saliva ($p < 0.05$) (Table 5).

Table 6 shows that the mean concentration of IgG_1 in cow's milk, fish, shrimp, egg, soy, wheat, brown, peanut, kiwi, papaya, banana, maize and cocoa did not differ significantly between serum and saliva ($p > 0,05$). But the mean IgG_1 concentration of the tomato in the Serum was significantly lower than in Saliva ($p < 0,05$).

Discussion

The diagnosis of food allergy by the detection of specific IgE and IgG_1 immunoglobulins using saliva was reported in this study, making this article the first work that reports the possibility of a noninvasive diagnosis for food allergy. In addition, the interaction of allergenic proteins with serum and saliva can be observed by detecting both IgE and IgG_1.

High levels of salivary IgE and IgG_1 specific for precipitated cow's milk proteins from 36 allergic children were detected by ELISA using the RAST test. Likewise, 100% of the experimental group also presented high levels of IgE and IgG_1 specific for the fish. Although fish is not usually used in the feeding of children in early childhood, the result suggests that these children have become sensitized by other routes of immunization other than oral, since fish is a food widely used by the population of Ceará. This is according to SICHERER et al. (2011) [15] which showed that most peanut allergy children experience their first allergic reaction to peanuts at the first intake, suggesting that the sensitization that resulted in IgE production must have occurred through exposure through a non-oral route. Two leading theories for the basis of such sensitization are *in utero* sensitization, or by home exposure through non-oral routes.

When analyzed with maize extract, the serum and salivary levels of specific IgE were observed in 36% and 39% of the samples, repectively. Similarly, IgG_1 were detected in 25% in the allergic group. Corn is a cereal widely used in Brazilian food, however, few studies have addressed specific allergic reactions to this food. Nonetheless, in one of them, performed in a

Table 3. Comparing the average concentration of IgE with the concentration of IgG1 in serum in each food by ELISA test.

Food	Parameter	n	Average (O.D.)	Standard deviation	p
Cow milk	IGE	36	0.430	0.078	$< 0.001^{£}$
	IGG_1	36	0.339	0.048	
Fish	IGE	36	0.461	0.125	$0.010^{‡}$
	IGG_1	36	0.393	0.089	
Shrimp	IGE	36	0.196	0.057	$0.631^{‡}$
	IGG_1	36	0.203	0.055	
Egg	IGE	36	0.217	0.092	$0.414^{£}$
	IGG_1	36	0.191	0.060	
Soy	IGE	36	0.219	0.072	$0.256^{‡}$
	IGG_1	36	0.202	0.060	
Wheat	IGE	36	0.218	0.057	$0.841^{‡}$
	IGG_1	36	0.216	0.056	
Cashew nut	IGE	36	0.204	0.060	$0.466^{‡}$
	IGG_1	36	0.195	0.053	
Peanut	IGE	36	0.187	0.046	$0.324^{‡}$
	IGG_1	36	0.177	0.044	
Corn	IGE	36	0.214	0.072	$0.477^{‡}$
	IGG_1	36	0.203	0.053	
Cocoa	IGE	36	0.154	0.034	$0.914^{‡}$
	IGG_1	36	0.155	0.032	
Kiwi	IGE	36	0.171	0.035	$0.591^{‡}$
	IGG_1	36	0.176	0.045	
Papaya	IGE	36	0.173	0.042	$0.814^{‡}$
	IGG_1	36	0.176	0.050	
Banana	IGE	36	0.185	0.047	$0.157^{‡}$
	IGG_1	36	0.169	0.048	
Tomato	IGE	36	0.165	0.042	$0.739^{‡}$
	IGG_1	36	0.169	0.048	

‡—Student t test for independent samples

£—Mann-Whitney test. Significant p value less than or equal to 0.05.

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multicenter study in eight different regions of Brazil (n = 306), being tested by means of the *prick test*, Rizzo et al (1995) [16] found a prevalence of 10.1% positive cutaneous reactivity for corn in the northeast region.

When soybean was used as antigen, the presence of specific serum IgE and IgG_1 were detected in 52% and 55% respectively and salivary IgE and IgG_1 in 55% and 53% of the allergic group. Similarly, for peanuts, serum IgE and IgG_1 reactivity were 36% and 39%, respectively; IgE and IgG_1 salivary 25% and 25% respectively. Still in Rizzo's study et al (1995) [16] a prevalence of 10.1% of cutaneous reactivity was also found for soybean and 8.4% for egg and peanut in northeastern Brazil.

For the egg white the presence of IgE and IgG_1 in the serum was 39% and 60%, respectively; while in saliva, IgE was observed in 55% and IgG_1 in 44%. When comparing specific IgE and IgG_1 levels in serum and saliva for the foods in this study, there was no significant difference.

These results demonstrated that, when comparing the levels of specific IgE and IgG_1 immunoglobulins in the serum and saliva for the foods tested, no statistical difference between them are found for most foods.

Table 4. Comparison of IgE concentration with IgG_1 concentration in saliva in each food.

Food	Parameter	n	Average (O.D.)	Standard Deviation	p
Cow milk	IGE	36	0.485	0.076	$< 0.001^{‡}$
	IGG_1	36	0.333	0.067	
Fish	IGE	36	0.376	0.082	$0.446^{‡}$
	IGG_1	36	0.391	0.081	
Shrimp	IGE	36	0.182	0.042	$0.106^{‡}$
	IGG_1	36	0.198	0.042	
Egg	IGE	36	0.201	0.054	$0.126^{‡}$
	IGG_1	36	0.182	0.045	
Soy	IGE	36	0.216	0.062	$0.235^{‡}$
	IGG_1	36	0.201	0.045	
Wheat	IGE	36	0.224	0.065	$0.847^{‡}$
	IGG_1	36	0.221	0.051	
Cashew nut	IGE	36	0.200	0.059	$0.764^{‡}$
	IGG_1	36	0.204	0.051	
Peanut	IGE	36	0.184	0.047	$0.571^{‡}$
	IGG_1	36	0.178	0.047	
Corn	IGE	36	0.182	0.058	$0.771^{‡}$
	IGG_1	36	0.186	0.047	
Cocoa	IGE	36	0.152	0.028	$0.492^{‡}$
	IGG_1	36	0.165	0.105	
Kiwi	IGE	36	0.179	0.043	$0.359^{‡}$
	IGG_1	36	0.169	0.044	
Papaya	IGE	36	0.208	0.053	$0.110^{‡}$
	IGG_1	36	0.183	0.076	
Banana	IGE	36	0.192	0.058	$0.930^{‡}$
	IGG_1	36	0.191	0.049	
Tomato	IGE	36	0.162	0.037	$0.003^{£}$
	IGG_1	36	0.197	0.057	

‡—Student t test for independent samples

£—Mann-Whitney test. Significant p value less than or equal to 0.05.

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Although IgE is the immunoglobulin identified as the mediator of food allergic reactions, several evidences show that systemic anaphylaxis can also be induced by IgG class immunoglobulins [6]. Mast cells can respond to both IgE and IgG antibodies. IgG antibodies in FA can influence the formation of immunocomplexes contradicting the traditional concept that these antibodies inhibit allergic processes [17]. Therefore, immunoglobulin G serves as a mediating effect rather than inhibiting the hypersensitivity reaction caused by food intolerance. Due to the great diversity of allergenic food products, it is believed that immunological reactions may be very different and their mechanisms may work in a more complicated way, requiring further studies [18].

Corroborating with the theory of IgG participate in the allergic process, Finkelman, Khodoun and Strait (2016) [6], observed in their study with mice that human IgG_1, IgG_2 and IgG_4 can bind to FcγRIII high affinity receptors, activating mast cells, basophils, neutrophils and macrophages, which leads to the production of PAF (platelet activation factor) in anaphylaxis in humans.

Table 5. Comparison of IgE concentration between serum and saliva in each food.

Food	Biological compartment	n	Average (O.D.)	Standard deviation	p
Cow milk	Serum	36	0.430	0.078	0.004‡
	Saliva	36	0.485	0.076	
Fish	Serum	36	0.461	0.125	0.016£
	Saliva	36	0.376	0.082	
Shrimp	Serum	36	0.196	0.057	0.421£
	Saliva	36	0.182	0.042	
Egg	Serum	36	0.217	0.092	0.987£
	Saliva	36	0.201	0.054	
Soy	Serum	36	0.219	0.072	0.849‡
	Saliva	36	0.216	0.062	
Wheat	Serum	36	0.218	0.057	0.712‡
	Saliva	36	0.224	0.065	
Cashew nut	Serum	36	0.204	0.060	0.740‡
	Saliva	36	0.200	0.059	
Peanut	Serum	36	0.187	0.046	0.761‡
	Saliva	36	0.184	0.047	
Corn	Serum	36	0.214	0.072	0.043‡
	Saliva	36	0.182	0.058	
Cocoa	Serum	36	0.154	0.034	0.811‡
	Saliva	36	0.152	0.028	
Kiwi	Serum	36	0.171	0.035	0.377‡
	Saliva	36	0.179	0.043	
Papaya	Serum	36	0.173	0.042	0.006£
	Saliva	36	0.208	0.053	
Banana	Serum	36	0.185	0.047	0.561‡
	Saliva	36	0.192	0.058	
Tomato	Serum	36	0.165	0.042	0.734‡
	Saliva	36	0.162	0.037	

‡—Student t test for independent samples

£—Mann-Whitney test. Significant p value less than or equal to 0.05.

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Both IgE and IgG antibodies are found in the serum of allergic patients, but the relative concentration of the various classes is poorly understood and rarely investigated. This may have important therapeutic consequences if, in fact, neutrophils can induce IgG-dependent anaphylactic reactions in humans [19]. The allergen-specific IgG_1 detection results shown in this study are relevant, since they show the specific IgE and IgG_1 detection for different foods studied in serum and saliva. In addition, this result shows that saliva can be used to diagnose FA.

Several researchers have been demonstrating the use of saliva for diagnosis of different diseases. As can be observed in the Luzza et al (1997) [20] study who compared salivary IgG levels to diagnose Helicobacter Pilory infections with the gold standard diagnostic test, finding significantly higher salivary IgG levels in people with HP infection when compared to the control group, presenting specificity and sensitivity of the salivary test of 82% and 93%.

According to the study by Cai et al. (2014) [21], a high prevalence of serum IgG antibodies to food allergens were found in allergic patients presenting intestinal symptoms, also reporting that this immunoglobulin is a potent indicator for the state of the allergic disease facilitating orientations during the diet. However, Mekkel et al (2005) [22] considers according to his

Table 6. Comparison of IgG_1 concentration between serum and saliva in each food.

Food	Biological compartment	n	Average (O.D.)	Standard deviation	p
Cow milk	Serum	36	0.339	0.048	0.654‡
	Saliva	36	0.333	0.067	
Fish	Serum	36	0.393	0.089	0.910‡
	Saliva	36	0.391	0.081	
Shrimp	Serum	36	0.203	0.055	0.696‡
	Saliva	36	0.198	0.042	
Egg	Serum	36	0.191	0.060	0.503‡
	Saliva	36	0.182	0.045	
Soy	Serum	36	0.202	0.060	0.975‡
	Saliva	36	0.201	0.045	
Wheat	Serum	36	0.216	0.056	0.675‡
	Saliva	36	0.221	0.051	
Cashew nut	Serum	36	0.195	0.053	0.463‡
	Saliva	36	0.204	0.051	
Peanut	Serum	36	0.177	0.044	0.934‡
	Saliva	36	0.178	0.047	
Corn	Serum	36	0.203	0.053	0.142‡
	Saliva	36	0.186	0.047	
Cocoa	Serum	36	0.155	0.032	0.589‡
	Saliva	36	0.165	0.105	
Kiwi	Serum	36	0.176	0.045	0.546‡
	Saliva	36	0.169	0.044	
Papaya	Serum	36	0.176	0.050	0.648‡
	Saliva	36	0.183	0.076	
Banana	Serum	36	0.169	0.048	0.055‡
	Saliva	36	0.191	0.049	
Tomato	Serum	36	0.169	0.048	0.010£
	Saliva	36	0.197	0.057	

‡—Student t test for independent samples

£—Mann-Whitney test. Significant p value less than or equal to 0.05.

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study that IgG is present, in significant amounts, rarely in immediate type reactions, being considered as the best indicator in this type of reaction to immunoglobulin E. Complementing the previous study, circulating IgG was shown to give a more delayed or even asymptomatic response following exposure to a single food in the Crowe and Perdue study (1992) [23], which report that IgG mediated reactions have a slower response after antigen exposure.

In the study made by Hochwallner et al. (2011) [24], it was investigated whether patients with non-IgE-mediated APLV can be distinguished from non-allergic individuals through serum IgA levels and IgG subclasses, showing higher levels of IgG_1 and IgG_4 for some types of caseins and α-lactoglobulin.

The test to diagnose FA currently considered gold standard is the oral provocation test, but it presents risks, a high cost and there are no practical alternatives, parameters and clear guidelines to discriminate which children should take this test [25]. In contrast, Volppi and Maccari (2009) [25] showed in their study that the ELISA technique is highly sensitive and specific for detecting the presence of serum antibodies, through IgE and IgG isotope tests for 160 different

dietary proteins in 6879 individuals, technique is considered low cost and does not cause allergic manifestations in the patient.

According to Hiller et al (2002) [26], the ELISA test allows to verify the profile of reactivity and the detection of allergic components by specific IgE in small amounts of serum but can not identify the allergic disease. But, according to Ramos, Lyra, Oliveira (2013) [27] the ELISA test is a less expensive, simpler and more sensitive feature used by many laboratories to test the presence of antibodies in patients allergic to numerous food antigens, since these have high levels of some IgG subtypes. In addition, some companies also produce kits for the detection of IgE, which, together with clinical examination, will aid in the selection of allergenic foods to be avoided by the patient.

Vojdani A. and Vojodani C. (2015) [28] report that some people are sensitive to lipids, and currently the skin tests are performed only with protein components dissolved in water, and may produce false negative results, making it fundamental to develop a methodology for this type of evaluation.

Therefore, Vojdani A. and Vojodani C. (2015) [28] stated that serological tests measuring both levels of IgG and IgE would make possible a diagnosis for more reliable allergy test, making it possible to diagnose both IgE-mediated, non-mediated and mixed allergies.

Final considerations

It was possible to verify with this study the similarity in the specificity and sensitivity that the ELISA test, using both serum and saliva for the detection of IgE and IgG_1, presented for the RAST test.

In this context, it was found that the use of saliva for the detection of IgE is more sensitive to diagnose CMPA alone because it has a higher amount, however IgG_1 also showed efficiency in the diagnosis of food allergy through saliva.

The use of salivary combined with the method to diagnose food allergy is suggested, with IgE and IgG_1 being measured in order to obtain more reliable results as well as to investigate mediated, non-IgE and mixed mediated allergies.

Supporting information

S1 File. Research instrument.
(PDF)

S2 File. Statistical Analysis Report.
(PDF)

S3 File. Closed free consent term.
(PDF)

S4 File. Raw data test diagnostic allergy.
(XLSX)

S5 File. Suplementary I.
(DOCX)

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PROTOCOLO DE INVESTIGAÇÃO DE ALERGIA ALIMENTAR

PROTOCOL FOR FOOD ALLERGY RESEARCH

NOME (NAME):_____
PRONTUÁRIO (PRONOUNCE NUMBER): _____

DN(date of birth**):**_____
IDADE ATUAL (AGE):_____

DIAGNÓSTICO PATOLÓGICO (diagnosis):_____

POR FAVOR RESPONDER AS PERGUNTAS ABAIXO (PLEASE ANSWER THE QUESTIONS BELOW) **:**

1- Porque procurou atendimento no Hospital Albert Sabin?
1- Why did you seek care at Albert Sabin Hospital?

_____
_____

2- Quais os sintomas que está apresentando?
2- What are the symptoms you are presenting?

_____
_____

3- Está tomando algum medicamento, ou tomou essa semana?
3-Are you taking any medication, or did you take it this week?

_____
_____

4- Tem alguma alergia à alimentos e/ou medicamentos?
4- Do you have any allergies to food and / or medications?

_____
_____

5- Tem Rinite, sinusite, faringite alérgia?
5 - Do you have rhinitis, sinusitis, allergic pharyngitis?

_____
_____

6- Você já comeu os alimentos abaixo, e com qual frequência?
6-Have you eaten the food below, and how often?

Milho ou derivados:_____
Sim ( ) Não ( ) - Apenas 1x ( ) Mais de 3x ( ) Come sempre ( )
Apresentou alguma reação alérgica: Sim ( ) Não ( )
Se SIM qual? ( )Urticária ( )Diarreia ( )Vômitos/Náusea ( )Dermatite
Outros:_____

Maize or derivatives: _____
Yes () No () - Only 1x () More than 3x () Always eats ()
Has any allergic reaction: Yes () No ()
If YES, which one? () Urticaria () Diarrhea () Vomiting / Nausea () Dermatitis
Others:_____

Mamão ou derivados:_____
Sim ( ) Não ( ) - Apenas 1x ( ) Mais de 3x ( ) Come sempre ( )
Apresentou alguma reação alérgica: Sim ( ) Não ( )
Se SIM qual? ( )Urticária ( )Diarreia ( )Vômitos/Náusea ( )Dermatite
Outros:_____

Papaya or derivatives: _____
Yes () No () - Only 1x () More than 3x () Always eats ()
Has any allergic reaction: Yes () No ()
If YES, which one? () Urticaria () Diarrhea () Vomiting / Nausea () Dermatitis
Others:_____

Leite de vaca ou derivados:_____
Sim ( ) Não ( ) - Apenas 1x ( ) Mais de 3x ( ) Come sempre ( )
Apresentou alguma reação alérgica: Sim ( ) Não ( )
Se SIM qual? ( )Urticária ( )Diarreia ( )Vômitos/Náusea ( )Dermatite
Outros:_____

Cow's Milk or Derivatives: _____
Yes () No () - Only 1x () More than 3x () Always eats ()
Has any allergic reaction: Yes () No ()
If YES, which one? () Urticaria () Diarrhea () Vomiting / Nausea () Dermatitis
Others:_____

Ovo de galinha ou derivados:_____
Sim ( ) Não ( ) - Apenas 1x ( ) Mais de 3x ( ) Come sempre ( )
Apresentou alguma reação alérgica: Sim ( ) Não ( )
Se SIM qual? ( )Urticária ( )Diarreia ( )Vômitos/Náusea ( )Dermatite
Outros:_____

Chicken d egg or derivatives: _____
Yes () No () - Only 1x () More than 3x () Always eats ()
Has any allergic reaction: Yes () No ()
If YES, which one? () Urticaria () Diarrhea () Vomiting / Nausea () Dermatitis
Others:_____

Soja ou derivados:_____
Sim ( ) Não ( ) - Apenas 1x ( ) Mais de 3x ( ) Come sempre ( )
Apresentou alguma reação alérgica: Sim ( ) Não ( )
Se SIM qual? ( )Urticária ( )Diarreia ( )Vômitos/Náusea ( )Dermatite
Outros:_____

Soy or derivatives: _____
Yes () No () - Only 1x () More than 3x () Always eats ()
Has any allergic reaction: Yes () No ()
If YES, which one? () Urticaria () Diarrhea () Vomiting / Nausea () Dermatitis
Others:_____

Amendoim ou derivados:_____
Sim ( ) Não ( ) - Apenas 1x ( ) Mais de 3x ( ) Come sempre ( )
Apresentou alguma reação alérgica: Sim ( ) Não ( )
Se SIM qual? ( )Urticária ( )Diarreia ( )Vômitos/Náusea ( )Dermatite
Outros:_____

Peanuts or derivatives: _____
Yes () No () - Only 1x () More than 3x () Always eats ()
Has any allergic reaction: Yes () No ()
If YES, which one? () Urticaria () Diarrhea () Vomiting / Nausea () Dermatitis
Others:_____

Já fez algum exame para detectar alergia? ( )Sim ( )Não
Qual?_____

Have you done any tests to detect allergy? () Yes () No Which one?

ANTECEDENTES FAMILIARES (FAMILY BACKGROUND:**):**

MÃE
(Mom):_____
_____
PAI
(Dad):_____
_____
IRMÃOS
(Brothers):_____
_____

PROTOCOLO DE HIPERSENSIBILIDADE ALIMENTAR

PROTEOL OF FOOD HYPERSENSITIVITY

NOME (NAME):_____
PRONTUÁRIO (PRONOUNCE NUMBER): _____

DN(date of birth**):**_____
IDADE ATUAL (AGE):_____

DIAGNÓSTICO PATOLÓGICO (diagnosis):_____
MÃE (Mom):_____

PAI (Dad):_____

TELEFONE (Phone):_____**DATA:**_____/_____/_____

ALEITAMENTO MATERNO (breastfeeding**): ( ) Yes, Exclusive** _____
( ) MIXTA ATÉ:_____
( ) No
QUEIXA PRINCIPAL (main complaint**):.....MARCAR COM UM X.....**

DOENÇAS Diseases	IDADE DO INÍCIO age of onset	DESENCANDEANTES suspicious food	TRATAMENTO DIETA/LEITE Tratament
URTICÁRIA			
ANGIODEMA			
DERMATITE			
VÔMITOS			
DIARREIA			
DOR ABDOMINAL			
BAIXO GANHO DE PESO			
SANGRAMENTOS			
LARINGITES			
OUTROS			

COMORBIDADES (comorbidities**):**
_____
_____
_____

OUTRAS ALERGIAS (other allergies**):**
_____
_____
_____

ANTECEDENTES FAMILIARES (FAMILY BACKGROUND**):**

MÃE (Mom):_____
PAI (Dad):_____
IRMÃOS
(Brothers):_____

HISTÓRIA ALIMENTAR (food history**)**

INTRODUÇÃO DE SÓLIDOS (introduction o solids**):**_____

DIETA ATUAL (current diet and meals**):**

CAFÉ:_____
LANCHE:_____
ALMOÇO:_____
LANCHE:_____
JANTAR:_____
NOITE:_____
OUTROS:_____

EXAME FÍSICO

PESO:_____**PERCENTIL:**_____
ESTATURA:_____**PERCENTIL:**_____
TURGOR:_____
PREGAS:_____
ABDOME:_____

PHYSICAL EXAM

WEIGHT: _____ PERCENTILE: _____
STATUS: _____ PERCENTILE: _____
TURGOR: _____
PREGAS: _____
ABDOME: _____

AVALIAÇÃO LABORATORIAL (LABORATORY EVALUATION:**):**

IgE:
IgA:
Ac Anti-transglutaminase:
Ac Anti-gliadina:
Ac Anti-endomisio:
Rast para alimentos ou PICK:
Alfa-1-antitripsina:
Bx com contagem de eosinófilos:
Bx com contagem de eosinófilos:
EDA:
COLONOSCOPIA:
PHMETRIA:

CONDUTA:_____
_____
RETORNO:_____

CONDUCT:_____
_____
RETURN: _____

RELATÓRIO DE ANÁLISE ESTATÍSTICA
STATISTICAL ANALYSIS REPORT

1-METODOLOGIA ESTATÍSTICA
1-STATISTICAL METHODOLOGY

As análises estatísticas deste trabalho foram realizadas no software R versão 3.4.1. Os dados foram expressos como medidas de tendência central e dispersão. Também foram apresentados gráficos de barra de erros com a média e o intervalo de confiança de 95%. Testou-se a normalidade das variáveis por meio do teste de Kolmogorov-Smirnov e homogeneidade das variâncias pelo teste de Levene. Para a comparação de médias utilizou-se o teste t de Student para amostras independentes, quando os dados foram normais e homogêneos, e o teste de Mann-Whitney, quando os dados foram não normais e não homogêneos. Para a comparação entre mais de duas médias, quando os dados apresentaram-se normais e homogêneos utilizou-se o teste de ANOVA, e quando não, o teste de Kruskal-Wallis, os quais foram seguidos pelo pós-teste de Tukey. Para a comparação dos valores médios das variáveis com o valor de referência utilizou-se o teste t de Student para uma amostra. Os resultados foram considerados significativos com valores de p abaixo de 0,05.

The statistical analyzes of this work were carried out in software R version 3.4.1. Data were expressed as measures of central tendency and dispersion. Also, error bar graphs with mean and 95% confidence intervals were presented. Normality of variables was tested using the Kolmogorov-Smirnov test and homogeneity of variances by the Levene test. For the comparison of means, the Student's t-test was used for independent samples, when the data were normal and homogeneous, and the Mann-Whitney test, when the data were non-normal and non-homogeneous. For the comparison of more than two means, when the data were normal and homogeneous, we used the ANOVA test and, if not, the Kruskal-Wallis test, which were followed by the Tukey post-test. For the comparison of the mean values of the variables with the reference value, Student's t-test was used for one sample. The results were considered significant with p values below 0.05.

2 – RESULTADOS

2 - *RESULTS*

Quadro 1. Comparação da concentração de IGE entre o soro e a saliva em cada alimento

Table 1. Comparison of the GGE concentration between serum and saliva in each feed

Alimento	Compartimento biológico	n	Média	Desvio Padrão	p
Leite de vaca	Soro	36	0,430	0,078	0,004‡
	Saliva	36	0,485	0,076	
Peixe	Soro	36	0,461	0,125	0,016£
	Saliva	36	0,376	0,082	
Camarão	Soro	36	0,196	0,057	0,421£
	Saliva	36	0,182	0,042	
Ovo	Soro	36	0,217	0,092	0,987£
	Saliva	36	0,201	0,054	
Soja	Soro	36	0,219	0,072	0,849‡
	Saliva	36	0,216	0,062	
Trigo	Soro	36	0,218	0,057	0,712‡
	Saliva	36	0,224	0,065	
Castanha	Soro	36	0,204	0,060	0,740‡
	Saliva	36	0,200	0,059	
Amendoim	Soro	36	0,187	0,046	0,761‡
	Saliva	36	0,184	0,047	
Kiwi	Soro	36	0,171	0,035	0,377‡
	Saliva	36	0,179	0,043	
Mamão	Soro	36	0,173	0,042	0,006£
	Saliva	36	0,208	0,053	
Banana	Soro	36	0,185	0,047	0,561‡
	Saliva	36	0,192	0,058	
Tomate	Soro	36	0,165	0,042	0,734‡
	Saliva	36	0,162	0,037	
Milho	Soro	36	0,214	0,072	0,043‡
	Saliva	36	0,182	0,058	
Cacau	Soro	36	0,154	0,034	0,811‡
	Saliva	36	0,152	0,028	

Legenda: ‡ - teste t de Student para amostras independentes; £ - teste te Mann-Whitney. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 1:

- A concentração média de IGE do camarão, do ovo, da soja, do trigo, da castanha, do amendoim, do kiwi, da banana, do tomate e do cacau não difeiru significativamente entre o Soro e a Saliva ($p > 0,05$).

- A concentração média de IGE do leite de vaca e do mamão no Soro foi significativamente menor que na Saliva ($p < 0,05$).
- A concentração média de IGE do peixe e do milho no Soro foi significativamente maior que na Saliva ($p < 0,05$).

Comment of table 1:

- The mean GGE concentration of shrimp, egg, soybean, wheat, peanut, peanut, kiwi, banana, tomato and cocoa did not differ significantly between serum and saliva ($p > 0.05$).
- The mean GGE concentration of cow's milk and papaya in serum was significantly lower than in Saliva ($p < 0.05$).
- The mean GGE concentration of fish and corn in serum was significantly higher than in saliva ($p < 0.05$).

Quadro 2. Comparação da concentração de IGG1 entre o soro e a saliva em cada alimento

Table 2. Comparison of IGG1 concentration between serum and saliva in each feed

Alimento	Compartimento biológico	n	Média	Desvio Padrão	p
Leite de vaca	Soro	36	0,339	0,048	0,654‡
	Saliva	36	0,333	0,067	
Peixe	Soro	36	0,393	0,089	0,910‡
	Saliva	36	0,391	0,081	
Camarão	Soro	36	0,203	0,055	0,696‡
	Saliva	36	0,198	0,042	
Ovo	Soro	36	0,191	0,060	0,503‡
	Saliva	36	0,182	0,045	
Soja	Soro	36	0,202	0,060	0,975‡
	Saliva	36	0,201	0,045	
Trigo	Soro	36	0,216	0,056	0,675‡
	Saliva	36	0,221	0,051	
Castanha	Soro	36	0,195	0,053	0,463‡
	Saliva	36	0,204	0,051	
Amendoim	Soro	36	0,177	0,044	0,934‡
	Saliva	36	0,178	0,047	
Kiwi	Soro	36	0,176	0,045	0,546‡
	Saliva	36	0,169	0,044	

Mamão	Soro	36	0,176	0,050	0,648‡
	Saliva	36	0,183	0,076	
Banana	Soro	36	0,169	0,048	0,055‡
	Saliva	36	0,191	0,049	
Tomate	Soro	36	0,169	0,048	0,010£
	Saliva	36	0,197	0,057	
Milho	Soro	36	0,203	0,053	0,142‡
	Saliva	36	0,186	0,047	
Cacau	Soro	36	0,155	0,032	0,589‡
	Saliva	36	0,165	0,105	

Legenda: ‡ - teste t de Student para amostras independentes; £ - teste te Mann-Whitney. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 2:

- A concentração média de IGG1 do leite de vaca, do peixe, do camarão, do ovo, da soja, do trigo, da castanha, do amendoim, do kiwi, do mamão, da banana, do milho e do cacau não difeiru significativamente entre o Soro e a Saliva ($p > 0,05$).
- A concentração média de IGG1 do tomate no Soro foi significativamente menor que na Saliva ($p < 0,05$).

Comment of table 2:

- The average IGG1 concentration of cow's milk, fish, shrimp, egg, soybeans, wheat, chestnut, peanut, kiwi, papaya, banana, maize and cocoa did not differ significantly between Serum and Saliva ($p > 0.05$).
- The mean serum IGG1 concentration in the serum was significantly lower than in Saliva ($p < 0.05$).

Quadro 3. Comparação da concentração de IGE com a concentração de IGG1 no soro em cada alimento

Table 3. Comparison of GGE concentration with serum IGG1 concentration in each feed

Alimento	Parâmetro	n	Média	Desvio Padrão	p
Leite de vaca	IGE	36	0,430	0,078	< 0,001£
	IGG1	36	0,339	0,048	
Peixe	IGE	36	0,461	0,125	0,010‡
	IGG1	36	0,393	0,089	
Camarão	IGE	36	0,196	0,057	0,631‡
	IGG1	36	0,203	0,055	

Ovo	IGE	36	0,217	0,092	0,414£
	IGG1	36	0,191	0,060	
Soja	IGE	36	0,219	0,072	0,256‡
	IGG1	36	0,202	0,060	
Trigo	IGE	36	0,218	0,057	0,841‡
	IGG1	36	0,216	0,056	
Castanha	IGE	36	0,204	0,060	0,466‡
	IGG1	36	0,195	0,053	
Amendoim	IGE	36	0,187	0,046	0,324‡
	IGG1	36	0,177	0,044	
Kiwi	IGE	36	0,171	0,035	0,591‡
	IGG1	36	0,176	0,045	
Mamão	IGE	36	0,173	0,042	0,814‡
	IGG1	36	0,176	0,050	
Banana	IGE	36	0,185	0,047	0,157‡
	IGG1	36	0,169	0,048	
Tomate	IGE	36	0,165	0,042	0,739‡
	IGG1	36	0,169	0,048	
Milho	IGE	36	0,214	0,072	0,477‡
	IGG1	36	0,203	0,053	
Cacau	IGE	36	0,154	0,034	0,914‡
	IGG1	36	0,155	0,032	

Legenda: ‡ - teste t de Student para amostras independentes; £ - teste te Mann-Whitney. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 3:

- No soro, a concentração de IGE e IGG1 do camarão, do ovo, da soja, do trigo, da castanha, do amendoim, do kiwi, do mamão, da banana, do tomate, do milho e do cacau não diferiu significativamente ($p > 0,05$).

- No soro, a concentração de IGE do leite de vaca e do peixe foi significativamente maior que a concentração de IGG1 ($p < 0,05$).

Comment of table 3:

- In the serum, the concentration of GI and IGG1 of shrimp, egg, soybean, wheat, chestnut, peanut, kiwi, papaya, banana, tomato, maize and cocoa did not differ significantly ($p > 0.05$).

- In serum, the concentration of GGE in cow's milk and fish was significantly higher than the concentration of IGG1 ($p <0.05$).

Quadro 4. Comparação da concentração de IGE com a concentração de IGG1 na saliva em cada alimento

Table 4. Comparison of GGE concentration with IGG1 concentration in saliva in each feed

Alimento	Parâmetro	n	Média	Desvio Padrão	p
Leite de vaca	IGE	36	0,485	0,076	< 0,001‡
	IGG1	36	0,333	0,067	
Peixe	IGE	36	0,376	0,082	0,446‡
	IGG1	36	0,391	0,081	
Camarão	IGE	36	0,182	0,042	0,106‡
	IGG1	36	0,198	0,042	
Ovo	IGE	36	0,201	0,054	0,126‡
	IGG1	36	0,182	0,045	
Soja	IGE	36	0,216	0,062	0,235‡
	IGG1	36	0,201	0,045	
Trigo	IGE	36	0,224	0,065	0,847‡
	IGG1	36	0,221	0,051	
Castanha	IGE	36	0,200	0,059	0,764‡
	IGG1	36	0,204	0,051	
Amendoim	IGE	36	0,184	0,047	0,571‡
	IGG1	36	0,178	0,047	
Kiwi	IGE	36	0,179	0,043	0,359‡
	IGG1	36	0,169	0,044	
Mamão	IGE	36	0,208	0,053	0,110‡
	IGG1	36	0,183	0,076	
Banana	IGE	36	0,192	0,058	0,930‡
	IGG1	36	0,191	0,049	
Tomate	IGE	36	0,162	0,037	0,003£
	IGG1	36	0,197	0,057	
Milho	IGE	36	0,182	0,058	0,771‡
	IGG1	36	0,186	0,047	
Cacau	IGE	36	0,152	0,028	0,492‡
	IGG1	36	0,165	0,105	

Legenda: ‡ - teste t de Student para amostras independentes; £ - teste te Mann-Whitney. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 4:

- Na saliva, a concentração de IGE e IGG1 do leite de vaca, do peixe, do camarão, do ovo, da soja, do trigo, da castanha, do amendoim, do kiwi, do mamão, da banana, do milho e do cacau não diferiu significativamente (p > 0,05).

- Na saliva, a concentração de IGE do tomate foi significativamente menor que a concentração de IGG1 ($p < 0,05$).

Comment of table 4:

- In saliva, the concentration of GI and IGG1 in cows' milk, fish, shrimp, egg, soybeans, wheat, chestnut, peanut, kiwi, papaya, banana, maize and cocoa did not differ significantly ($p > 0.05$).
- In the saliva, the GGE concentration of the tomato was significantly lower than the IGG1 concentration ($p < 0.05$).

Quadro 5. Comparação das variáveis com o cuttoff em cada alimento

Table 5. Comparison of the variables with the cuttoff in each food

Alimento	Parâmetro	n	Mínimo	Máximo	Média	Desvio Padrão	Cuttoff	p
Leite de vaca	IGE no Soro	36	0,249	0,638	0,430	0,078	0,135	< 0,001
	IGE na Saliva	36	0,363	0,752	0,485	0,076	0,137	< 0,001
	IGG1 no soro	36	0,266	0,554	0,339	0,048	0,140	< 0,001
	IGG1 na saliva	36	0,235	0,566	0,333	0,067	0,142	< 0,001
Peixe	IGE no Soro	36	0,247	0,730	0,461	0,125	0,140	< 0,001
	IGE na Saliva	36	0,222	0,482	0,376	0,082	0,150	< 0,001
	IGG1 no soro	36	0,238	0,524	0,393	0,089	0,150	< 0,001
	IGG1 na saliva	36	0,211	0,508	0,391	0,081	0,191	< 0,001
Camarão	IGE no Soro	36	0,113	0,332	0,196	0,057	0,178	< 0,001
	IGE na Saliva	36	0,115	0,325	0,182	0,042	0,160	0,003
	IGG1 no soro	36	0,116	0,341	0,203	0,055	0,174	0,003
	IGG1 na saliva	36	0,128	0,301	0,198	0,042	0,164	< 0,001
Ovo	IGE no Soro	36	0,120	0,552	0,217	0,092	0,208	0,563
	IGE na Saliva	36	0,121	0,325	0,201	0,054	0,187	0,138
	IGG1 no soro	36	0,107	0,409	0,191	0,060	0,181	0,328
	IGG1 na saliva	36	0,123	0,333	0,182	0,045	0,177	0,473
Soja	IGE no Soro	36	0,120	0,411	0,219	0,072	0,213	0,593
	IGE na Saliva	36	0,131	0,358	0,216	0,062	0,212	0,669
	IGG1 no soro	36	0,112	0,411	0,202	0,060	0,192	0,348
	IGG1 na saliva	36	0,131	0,305	0,201	0,045	0,213	0,125
Trigo	IGE no Soro	36	0,124	0,358	0,218	0,057	0,215	0,731
	IGE na Saliva	36	0,123	0,411	0,224	0,065	0,212	0,287
	IGG1 no soro	36	0,120	0,358	0,216	0,056	0,218	0,801
	IGG1 na saliva	36	0,123	0,358	0,221	0,051	0,219	0,819
Castanha	IGE no Soro	36	0,122	0,384	0,204	0,060	0,226	0,038
	IGE na Saliva	36	0,122	0,358	0,200	0,059	0,223	0,024

	IGG1 no soro	36	0,123	0,355	0,195	0,053	0,223	0,003
	IGG1 na saliva	36	0,131	0,276	0,204	0,051	0,216	0,152
Amendoim	IGE no Soro	36	0,115	0,334	0,187	0,046	0,192	0,526
	IGE na Saliva	36	0,123	0,308	0,184	0,047	0,187	0,682
	IGG1 no soro	36	0,122	0,270	0,177	0,044	0,199	0,004
	IGG1 na saliva	36	0,118	0,269	0,178	0,047	0,185	0,342
Kiwi	IGE no Soro	36	0,113	0,251	0,171	0,035	0,213	< 0,001
	IGE na Saliva	36	0,112	0,266	0,179	0,043	0,220	< 0,001
	IGG1 no soro	36	0,128	0,334	0,176	0,045	0,199	0,004
	IGG1 na saliva	36	0,125	0,283	0,169	0,044	0,228	< 0,001
Mamão	IGE no Soro	36	0,123	0,267	0,173	0,042	0,188	0,042
	IGE na Saliva	36	0,126	0,288	0,208	0,053	0,193	0,098
	IGG1 no soro	36	0,123	0,356	0,176	0,050	0,197	0,016
	IGG1 na saliva	36	0,129	0,578	0,183	0,076	0,201	0,164
Banana	IGE no Soro	36	0,134	0,318	0,185	0,047	0,187	0,763
	IGE na Saliva	36	0,129	0,358	0,192	0,058	0,191	0,929
	IGG1 no soro	36	0,115	0,271	0,169	0,048	0,190	0,011
	IGG1 na saliva	36	0,120	0,294	0,191	0,049	0,187	0,646
Tomate	IGE no Soro	36	0,103	0,272	0,165	0,042	0,201	< 0,001
	IGE na Saliva	36	0,122	0,271	0,162	0,037	0,193	< 0,001
	IGG1 no soro	36	0,115	0,271	0,169	0,048	0,197	0,001
	IGG1 na saliva	36	0,108	0,288	0,197	0,057	0,185	0,198
Milho	IGE no Soro	36	0,127	0,448	0,214	0,072	0,248	0,007
	IGE na Saliva	36	0,106	0,332	0,182	0,058	0,238	< 0,001
	IGG1 no soro	36	0,133	0,289	0,203	0,053	0,243	< 0,001
	IGG1 na saliva	36	0,120	0,296	0,186	0,047	0,231	< 0,001
Cacau	IGE no Soro	36	0,108	0,246	0,154	0,034	0,194	< 0,001
	IGE na Saliva	36	0,104	0,260	0,152	0,028	0,200	< 0,001
	IGG1 no soro	36	0,107	0,288	0,155	0,032	0,191	< 0,001
	IGG1 na saliva	36	0,108	0,757	0,165	0,105	0,199	0,057

Legenda: ‡ - teste t de Student para uma amostra. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 5:

- A concentração média de IGE no Soro, de IGE na Saliva, de IGG1 no Soro e de IGG1 na Saliva do leite de vaca foi significativamente maior que o Cuttoff desses parâmetros ($p < 0,05$).

- A concentração média de IGE no Soro, de IGE na Saliva, de IGG1 no Soro e de IGG1 na Saliva do peixe foi significativamente maior que o Cuttoff desses parâmetros ($p < 0,05$).

- A concentração média de IGE no Soro, de IGE na Saliva, de IGG1 no Soro e de IGG1 na Saliva do camarão foi significativamente maior que o Cuttoff desses parâmetros ($p < 0,05$).

- A concentração média de IGE no Soro, de IGE na Saliva, de IGG1 no Soro e de IGG1 na Saliva do ovo não diferiu significativamente do Cuttoff desses parâmetros ($p > 0,05$).
- A concentração média de IGE no Soro, de IGE na Saliva, de IGG1 no Soro e de IGG1 na Saliva da soja não diferiu significativamente do Cuttoff desses parâmetros ($p > 0,05$).
- A concentração média de IGE no Soro, de IGE na Saliva, de IGG1 no Soro e de IGG1 na Saliva do trigo não diferiu significativamente do Cuttoff desses parâmetros ($p > 0,05$).
- A concentração média de IGE no Soro, de IGE na Saliva e de IGG1 no Soro da castanha foi significativamente menor que o Cuttoff desses parâmetros ($p < 0,05$). A concentração média de IGG1 na Saliva não diferiu significativamente do Cuttoff desse parâmetro ($p > 0,05$).
- A concentração média de IGE no Soro, de IGE na Saliva e de IGG1 na Saliva do amendoim não diferiu significativamente do Cuttoff desses parâmetros ($p > 0,05$). A concentração média de IGG1 no Soro foi significativamente menor que o Cuttoff desse parâmetro ($p < 0,05$).
- A concentração média de IGE no Soro, de IGE na Saliva, de IGG1 no Soro e de IGG1 na Saliva do kiwi foi significativamente menor que o Cuttoff desses parâmetros ($p < 0,05$).
- A concentração média de IGE na Saliva e de IGG1 na Saliva do mamão não diferiu significativamente do Cuttoff desses parâmetros ($p > 0,05$). A concentração média de IGE no Soro e IGG1 no Soro foi significativamente menor que o Cuttoff desse parâmetro ($p < 0,05$).
- A concentração média de IGE no Soro, de IGE na Saliva e de IGG1 na Saliva da banana não diferiu significativamente do Cuttoff desses parâmetros ($p > 0,05$). A concentração média de IGG1 no Soro foi significativamente menor que o Cuttoff desse parâmetro ($p < 0,05$).
- A concentração média de IGE no Soro, de IGE na Saliva e de IGG1 no Soro do tomate foi significativamente menor que o Cuttoff desse parâmetro ($p < 0,05$). A concentração média de IGG1 na Saliva não diferiu significativamente do Cuttoff desses parâmetros ($p > 0,05$).

- A concentração média de IGE no Soro, de IGE na Saliva, de IGG1 no Soro e de IGG1 na Saliva do milho foi significativamente menor que o Cuttoff desses parâmetros (p < 0,05).
- A concentração média de IGE no Soro, de IGE na Saliva e de IGG1 no Soro do cacau foi significativamente menor que o Cuttoff desses parâmetros (p < 0,05). A concentração média de IGG1 na Saliva não diferiu significativamente do Cuttoff desse parâmetro (p > 0,05).

Comment of table 5:

- The mean concentration of serum GGE, GGE in Saliva, IGG1 in serum and IGG1 in cow's milk saliva was significantly higher than the cuttoff of these parameters (p <0.05).
- The mean concentration of serum GGE, GGE in Saliva, IGG1 in serum and IGG1 in fish saliva was significantly higher than the cuttoff of these parameters (p <0.05).
- The mean concentration of serum GGE, GGE in Saliva, IGG1 in serum and IGG1 in shrimp saliva was significantly higher than the cuttoff of these parameters (p <0.05).
- The mean concentration of serum GGE, GGE in Saliva, IGG1 in serum and IGG1 in egg saliva did not differ significantly from Cuttoff of these parameters (p> 0.05).
- The mean concentration of serum GGE, GGE in Saliva, IGG1 in serum and IGG1 in soybean saliva did not differ significantly from Cuttoff of these parameters (p> 0.05).
- The mean concentration of serum GGE, GGE in Saliva, IGG1 in serum and IGG1 in wheat saliva did not differ significantly from Cuttoff of these parameters (p> 0.05).
- The mean concentration of serum GGE, GGE in Saliva and IGG1 in Chestnut serum was significantly lower than the Cuttoff of these parameters (p <0.05). The mean concentration of IGG1 in Saliva did not differ significantly from the Cuttoff of this parameter (p> 0.05).
- The mean concentration of serum GGE, GGE in Saliva and IGG1 in peanut saliva did not differ significantly from Cuttoff of these parameters (p> 0.05). The

mean concentration of IGG1 in serum was significantly lower than the cuttoff of this parameter (p <0.05).

- The mean concentration of serum GGE, GGE in Saliva, IGG1 in serum and IGG1 in kiwi Saliva was significantly lower than the Cuttoff of these parameters (p <0.05).

The mean GGE concentration in Saliva and IGG1 in papaya Saliva did not differ significantly from Cuttoff of these parameters (p> 0.05). The mean concentration of serum GGE and IGG1 in serum was significantly lower than the cuttoff of this parameter (p <0.05).

- The mean concentration of serum GGE, GGE in Saliva and IGG1 in banana Saliva did not differ significantly from Cuttoff of these parameters (p> 0.05). The mean concentration of IGG1 in serum was significantly lower than the cuttoff of this parameter (p <0.05).

- The mean concentration of serum GGE, GGE in Saliva and IGG1 in tomato serum was significantly lower than the Cuttoff of this parameter (p <0.05). The mean concentration of IGG1 in Saliva did not differ significantly from Cuttoff of these parameters (p> 0.05).

- The mean concentration of serum GGE, GGE in Saliva, IGG1 in serum and IGG1 in corn saliva was significantly lower than the cuttoff of these parameters (p <0.05).

- The mean concentration of serum GGE, GGE in Saliva and IGG1 in Cocoa Serum was significantly lower than the Cuttoff of these parameters (p <0.05). The mean concentration of IGG1 in Saliva did not differ significantly from the Cuttoff of this parameter (p> 0.05).

Quadro 6. Comparação da concentração de IGE no Soro entre os alimentos

Table 6. Comparison of serum GGE concentration between foods

Parâmetro	Alimento	n	Média	Intervalo de confiança (95%)		p£
				Limite inferior	Limite superior	
IGE no Soro	Leite de vaca	36	0,430 (0,078)[a]	0,404	0,457	< 0,001
	Peixe	36	0,461 (0,125)[a]	0,419	0,503	
	Camarão	36	0,196 (0,057)[b,c,d]	0,177	0,216	
	Ovo	36	0,217 (0,092)[b,j]	0,186	0,248	
	Soja	36	0,219 (0,072)[b]	0,195	0,244	
	Trigo	36	0,218 (0,057)[b]	0,199	0,238	

Castanha	36	0,204 (0,060)^{b,e}	0,184	0,225	
Amendoim	36	0,187 (0,046)^{b,f}	0,172	0,203	
Kiwi	36	0,171 (0,035)^{b,g}	0,159	0,183	
Mamão	36	0,173 (0,042)^{b,h}	0,159	0,187	
Banana	36	0,185 (0,047)^{b,i}	0,169	0,201	
Tomate	36	0,165 (0,042)^{d,e,f,g,h,i,j}	0,151	0,179	
Milho	36	0,214 (0,072)^{b,j}	0,190	0,238	
Cacau	36	0,154 (0,034)^{c,e,f,g,h,i}	0,142	0,165	

Legenda: £ - teste de Kruskal-Wallis. Letras iguais indicam que não há diferença significativa e letras diferentes indicam que há diferença significativa entre os grupos segundo o teste de Tukey. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 6:

- A concentração média de IGE do leite de vaca no Soro não diferiu significativamente da IGE do peixe no Soro ($p = 0,784$), mas foi significativamente maior que a concentração média de IGE de todos os outros alimentos pesquisados no Soro ($p < 0,05$).
- A concentração média de IGE do peixe no Soro não diferiu significativamente da IGE do leite de vaca no Soro ($p = 0,784$), mas foi significativamente maior que a concentração média de IGE de todos os outros alimentos pesquisados no Soro ($p < 0,05$).
- A concentração média de IGE do camarão no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro ($p < 0,05$), mas não diferiu significativamente da concentração média de IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE do ovo no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro e foi significativamente maior que no cacau ($p < 0,05$). Porém, não diferiu significativamente da IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE da soja no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro e foi significativamente maior que no tomate e no cacau ($p < 0,05$). Porém, não diferiu significativamente da IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE do trigo no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro e foi significativamente maior que no tomate e no cacau ($p < 0,05$). Porém, não diferiu significativamente da IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).

- A concentração média de IGE da castanha no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro ($p < 0,05$), mas não diferiu significativamente da concentração média de IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE do amendoim no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro ($p < 0,05$), mas não diferiu significativamente da concentração média de IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE do kiwi no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro ($p < 0,05$), mas não diferiu significativamente da IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE do mamão no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro ($p < 0,05$), mas não diferiu significativamente da concentração média de IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE da banana no Soro foi significativamente menor que a IGE do leite de vaca e peixe no Soro ($p < 0,05$), mas não diferiu significativamente da IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE do tomate no Soro foi significativamente menor que a concentração média de IGE do leite de vaca, peixe, soja e trigo no Soro ($p < 0,05$), mas não diferiu significativamente da concentração média de IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE do milho no Soro foi significativamente menor que a concentração média de IGE do leite de vaca e peixe no Soro e foi significativamente maior que a concentração média de IGE do cacau no Soro ($p < 0,05$). Porém, não diferiu significativamente da concentração média de IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGE do cacau no Soro foi significativamente menor que a concentração média de IGE do leite de vaca, peixe, ovo, soja, trigo e milho no Soro ($p < 0,05$), mas não diferiu significativamente da concentração média de IGE dos outros alimentos pesquisados no Soro ($p > 0,05$).

Comment of table 6:

- The mean serum concentration of cow's milk in the serum did not differ significantly from the GGE of the fish in the serum (p = 0.784), but was significantly higher than the mean GGE concentration of all other foods in the serum (p <0, 05).
- The mean serum GGE concentration of the fish did not differ significantly from the GSE of the cow's milk in the serum (p = 0.784), but it was significantly higher than the mean GGE concentration of all other foods investigated in the serum (p <0, 05).
- The mean serum concentration of shrimp in the serum was significantly lower than the GGE of cow's milk and fish in the serum (p <0.05), but did not differ significantly from the mean GGE concentration of the other foods in Soro (p> 0.05).
- The mean serum EGF concentration in the serum was significantly lower than the GGE of the cow's milk and fish in the serum and was significantly higher than in the cocoa (p <0.05). However, it did not differ significantly from the GGE of the other foods investigated in the Serum (p> 0.05).
- The mean serum concentration of soybean in the serum was significantly lower than the GGE of cow's milk and fish in the serum and was significantly higher than in tomato and cocoa (p <0.05). However, it did not differ significantly from the GGE of the other foods investigated in the Serum (p> 0.05).
- The mean serum GGE concentration in Whey was significantly lower than the GGE of cow's milk and fish in the Serum and was significantly higher than in tomato and cocoa (p <0.05). However, it did not differ significantly from the GGE of the other foods investigated in the Serum (p> 0.05).
- Mean serum GGE concentration in the serum was significantly lower than the GGE of cow's milk and fish in the serum (p <0.05), but did not differ significantly from the mean GGE concentration of the other foods tested in the serum (p> 0.05).
- The mean concentration of whey peanut in the serum was significantly lower than the GGE of cow's milk and fish in the serum (p <0.05), but did not differ significantly from the mean GGE concentration of the other foods in Soro (p> 0.05).

- The mean serum concentration of kiwi in the serum was significantly lower than the GGE of cow's milk and fish in the serum ($p < 0.05$), but did not differ significantly from the GGE of the other foods tested in the serum ($p > 0.05$).
- Mean serum GI concentration in the serum was significantly lower than the GGE of cow's milk and fish in the serum ($p < 0.05$), but did not differ significantly from the mean GGE concentration of the other foods tested in the serum ($p > 0.05$).
- Mean serum GI concentration of the banana in the serum was significantly lower than the GGE of cow's milk and fish in the serum ($p < 0.05$), but did not differ significantly from the GGE of the other foods tested in the serum ($p>0.05$).
- The mean concentration of GGE of the tomato in the Serum was significantly lower than the average concentration of GSE of the cow's milk, fish, soy and wheat in the Serum ($p < 0.05$), but did not differ significantly from the average GGE concentration of the others serum levels ($p > 0.05$).
- The mean serum GGE concentration in the serum was significantly lower than the mean GGE concentration of cow's milk and fish in the serum and was significantly higher than the mean serum GI concentration in the serum ($p < 0.05$). However, it did not differ significantly from the mean GGE concentration of the other foods tested in the Serum ($p > 0.05$).
- Mean serum CGE concentration in Whey was significantly lower than the mean GGE concentration of Wheat, Fish, Egg, Soy, Wheat and Corn milk in the serum ($p < 0.05$), but did not differ significantly from the mean concentration of the other foods investigated in serum ($p > 0.05$).

Quadro 7. Comparação da concentração de IGE na Saliva entre os alimentos

Table 7. Comparison of Saliva GSE concentration between foods

Parâmetro	Alimento	n	Média	Intervalo de confiança (95%)		p£
				Limite inferior	Limite superior	
IGE na Saliva	Leite de vaca	36	0,485 (0,076)[a]	0,459	0,510	< 0,001
	Peixe	36	0,376 (0,082)[b]	0,349	0,404	
	Camarão	36	0,182 (0,042)[c,d,g]	0,168	0,196	
	Ovo	36	0,201 (0,054)[c,g,j]	0,182	0,219	
	Soja	36	0,216 (0,062)[c,g]	0,196	0,237	
	Trigo	36	0,224 (0,065)[g]	0,202	0,245	
	Castanha	36	0,200 (0,059)[c,e,g]	0,180	0,220	
	Amendoim	36	0,184 (0,047)[c,f,g]	0,168	0,200	
	Kiwi	36	0,179 (0,043)[c,h]	0,164	0,194	
	Mamão	36	0,208 (0,053)[c,g]	0,190	0,226	
	Banana	36	0,192 (0,058)[c,g,i]	0,172	0,211	
	Tomate	36	0,162 (0,037)[d,e,f,h,i,j]	0,149	0,174	
	Milho	36	0,182 (0,058)[c,g,j,k]	0,163	0,202	
	Cacau	36	0,152 (0,028)[d,f,i,k]	0,143	0,161	

Legenda: £ - teste de Kruskal-Wallis. Letras iguais indicam que não há diferença significativa e letras diferentes indicam que há diferença significativa entre os grupos segundo o teste de Tukey. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 7:

- A concentração média de IGE do leite de vaca na Saliva é significativamente maior que a concentração média de IGE de todos os outros alimentos pesquisados na Saliva ($p < 0,05$).
- A concentração média de IGE do peixe na Saliva é significativamente menor que a concentração média de IGE do leite de vaca na Saliva ($p < 0,05$), mas é significativamente maior que a concentração média de IGE de todos os outros alimentos pesquisados na Saliva ($p < 0,05$).
- A concentração média de IGE do camarão na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).
- A concentração média de IGE do ovo na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva e maior que a concentração média de IGE do cacau na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).

- A concentração média de IGE da soja na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva e maior que a concentração média de IGE do tomate e cacau na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).
- A concentração média de IGE do trigo na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva e maior que a concentração média de IGE do tomate e cacau na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).
- A concentração média de IGE do trigo na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva e maior que a concentração média de IGE do cacau na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).
- A concentração média de IGE do amendoim na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).
- A concentração média de IGE do kiwi na Saliva é significativamente menor que a concentração média de IGE do leite de vaca, peixe e trigo na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).
- A concentração média de IGE do mamão na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva e maior que a concentração média de IGE do tomate e cacau na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).
- A concentração média de IGE da banana na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva ($p > 0,05$).
- A concentração média de IGE do tomate na Saliva é significativamente menor que a concentração média de IGE do leite de vaca, peixe, soja, trigo e mamão

na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva (p > 0,05).

- A concentração média de IGE do milho na Saliva é significativamente menor que a concentração média de IGE do leite de vaca e peixe na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva (p > 0,05).
- A concentração média de IGE do cacau na Saliva é significativamente menor que a concentração média de IGE do leite de vaca, peixe, ovo, soja, trigo, castanha e mamão na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGE dos outros alimentos pesquisados na Saliva (p > 0,05).

Comment of table 7:

- The mean GGE concentration of cow's milk in Saliva is significantly higher than the mean GGE concentration of all the other foods investigated in Saliva (p <0.05).
- The mean GGE concentration of fish in Saliva is significantly lower than the mean GGE concentration of Saliva cow's milk (p <0.05), but it is significantly higher than the mean GGE concentration of all other foods Saliva (p <0.05).
- The mean GGE concentration of shrimp in Saliva is significantly lower than the mean GGE concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean GGE concentration of the other foods surveyed in Saliva (p> 0.05).
- The mean GGE concentration of the egg in Saliva is significantly lower than the mean GGE concentration of cow's milk and fish in Saliva and higher than the mean GGE concentration of the cocoa in Saliva (p <0.05), but does not differ of the other foods investigated in Saliva (p> 0.05).
- The mean GGE concentration of soybean in Saliva is significantly lower than the average GGE concentration of cow's milk and fish in Saliva and higher than the mean GGE concentration of tomato and cacao in Saliva (p <0.05), but did not differ significantly from the mean GGE concentration of the other foods surveyed in Saliva (p> 0.05).
- The mean GGE concentration of wheat in Saliva is significantly lower than the mean GGE concentration of cow's milk and fish in Saliva and higher than the

mean GGE concentration of the tomato and cacao in Saliva ($p < 0.05$), but did not differ significantly from the mean GGE concentration of the other foods surveyed in Saliva ($p > 0.05$).

- The mean GGE concentration of wheat in Saliva is significantly lower than the average GGE concentration of cow's milk and fish in Saliva and higher than the mean concentration of GGE in Saliva ($p < 0.05$), but it does not differ of the other foods investigated in Saliva ($p > 0.05$).
- The mean GI concentration of the peanut in Saliva is significantly lower than the mean GGE concentration of cow's milk and fish in Saliva ($p < 0.05$), but does not differ significantly from the mean GGE concentration of the other foods investigated in Saliva ($p > 0.05$).
- The mean concentration of KGE in Saliva is significantly lower than the average concentration of GGE in cows, fish and wheat in Saliva ($p < 0.05$), but does not differ significantly from the average concentration of GGE in the other foods in Saliva ($p > 0.05$).
- The mean GGE concentration of papaya in Saliva is significantly lower than the mean GGE concentration of cow's milk and fish in Saliva and higher than the mean concentration of GGE in tomato and cacao in Saliva ($p < 0.05$), but did not differ significantly from the mean GGE concentration of the other foods surveyed in Saliva ($p > 0.05$).
- The mean GI concentration of the banana in Saliva is significantly lower than the mean GGE concentration of cow's milk and fish in Saliva ($p < 0.05$), but does not differ significantly from the average GGE concentration of the other foods surveyed in Saliva ($p > 0.05$).
- The mean concentration of GGE of the tomato in Saliva is significantly lower than the average concentration of GGE of cow's milk, fish, soy, wheat and papaya in Saliva ($p < 0.05$), but does not differ significantly from the average concentration of GGE of the other foods researched in Saliva ($p > 0.05$).
- The mean GGE concentration of corn in Saliva is significantly lower than the mean GGE concentration of cow's milk and fish in Saliva ($p < 0.05$), but it does not differ significantly from the mean GGE concentration of the other foods investigated in Saliva ($p > 0.05$).
- The mean GGE concentration of the cocoa in Saliva is significantly lower than the mean GGE concentration of cow's milk, fish, egg, soy, wheat, chestnut and

papaya in Saliva (p <0.05), but does not differ significantly from mean GGE concentration of the other foods investigated in Saliva (p> 0.05).

Quadro 8. Comparação da concentração de IGG1 no Soro entre os alimentos

Table 8. Comparison of serum IGG1 concentration between foods

Parâmetro	Alimento	n	Média	Intervalo de confiança (95%)		p£
				Limite inferior	Limite superior	
IGG1 no Soro	Leite de vaca	36	0,339 (0,048)[a]	0,323	0,355	< 0,001
	Peixe	36	0,393 (0,089)[b]	0,363	0,423	
	Camarão	36	0,203 (0,055)[c,f,g]	0,184	0,221	
	Ovo	36	0,191 (0,060)[c,d,e,f,g]	0,171	0,211	
	Soja	36	0,202 (0,060)[c,f,g]	0,181	0,222	
	Trigo	36	0,216 (0,056)[c,f]	0,197	0,235	
	Castanha	36	0,195 (0,053)[c,e,f,g]	0,177	0,212	
	Amendoim	36	0,177 (0,044)[c,e,f,g]	0,162	0,191	
	Kiwi	36	0,176 (0,045)[c,e,f,g]	0,160	0,191	
	Mamão	36	0,176 (0,050)[c,e,f,g]	0,159	0,193	
	Banana	36	0,169 (0,048)[e,g]	0,152	0,185	
	Tomate	36	0,169 (0,048)[e,g]	0,152	0,185	
	Milho	36	0,203 (0,053)[c,f,g]	0,185	0,221	
	Cacau	36	0,155 (0,032)[d,e]	0,144	0,166	

Legenda: £ - teste de Kruskal-Wallis. Letras iguais indicam que não há diferença significativa e letras diferentes indicam que há diferença significativa entre os grupos segundo o teste de Tukey. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 8:

- A concentração média de IGG1 do leite de vaca no Soro é significativamente menor que a concentração média de IGG1 do peixe no Soro (p < 0,05), mas é significativamente maior que a concentração média de IGG1 de todos os outros alimentos pesquisados no Soro (p < 0,05).
- A concentração média de IGG1 do peixe no Soro é significativamente maior que a concentração média de IGG1 de todos os outros alimentos pesquisados no Soro (p < 0,05).
- A concentração média de IGG1 do camarão no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro e significativamente maior que a concentração média de IGG1 do cacau no Soro (p < 0,05), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro (p > 0,05).

- A concentração média de IGG1 do ovo no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro ($p < 0,05$), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGG1 da soja no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro e significativamente maior que a concentração média de IGG1 do cacau no Soro ($p < 0,05$), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGG1 do trigo no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro e significativamente maior que a concentração média de IGG1 da banana, tomate e cacau no Soro ($p < 0,05$), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGG1 da castanha no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro ($p < 0,05$), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGG1 do amendoim no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro ($p < 0,05$), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGG1 do kiwi no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro ($p < 0,05$), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGG1 do mamão no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro ($p < 0,05$), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro ($p > 0,05$).
- A concentração média de IGG1 da banana no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca, do peixe e do trigo

no Soro (p < 0,05), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro (p > 0,05).
- A concentração média de IGG1 do tomate no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca, do peixe e do trigo no Soro (p < 0,05), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro (p > 0,05).
- A concentração média de IGG1 do milho no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca e do peixe no Soro e significativamente maior que a concentração média de IGG1 do cacau no Soro (p < 0,05), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro (p > 0,05).
- A concentração média de IGG1 do cacau no Soro é significativamente menor que a concentração média de IGG1 do leite de vaca, do peixe, do camarão, da soja, do trigo e do milho no Soro (p < 0,05), mas não difere significativamente da concentração média de IGG1 de todos os outros alimentos pesquisados no Soro (p > 0,05).

Comment of table 8:

- The mean concentration of IGG1 in cow's milk in serum is significantly lower than the mean concentration of IGF-1 in the serum (p <0.05), but is significantly higher than the mean IGG1 concentration of all other foods Serum (p <0.05).
- The mean IGG1 concentration of the fish in serum is significantly higher than the mean IGG1 concentration of all other foods screened in serum (p <0.05).
- The mean serum IGG1 concentration of shrimp in serum is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum and significantly higher than the mean concentration of IGG1 in serum (p <0.05), but does not differ significantly from the mean IGG1 concentration of all other foods screened in serum (p> 0.05).
- Mean serum IGG1 concentration in serum is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum (p <0.05) but does not differ significantly from the mean IGG1 concentration of all other foods serum levels (p> 0.05).
- Mean serum IGG1 concentration in serum is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum and significantly higher than

the mean IGF-1 concentration of serum cocoa (p <0.05), but does not differ significantly from the mean IGG1 concentration of all other foods screened in serum (p> 0.05).

- Mean serum IGG1 concentration in Whey is significantly lower than the mean IGG1 concentration of cow's milk and fish in Whey and significantly higher than the mean concentration of IGG1 of banana, tomato and cocoa in Whey (p <0, 05), but did not differ significantly from the mean IGG1 concentration of all other foods screened in serum (p> 0.05).
- Mean serum IGG1 concentration in serum is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum (p <0.05) but does not differ significantly from the mean IGF-1 concentration of all other foods serum levels (p> 0.05).
- The mean serum IGG1 concentration of Whey Peanut is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum (p <0.05), but does not differ significantly from the mean IGG1 concentration of all other foods serum levels (p> 0.05).
- The mean IGF-1 concentration of kiwi in serum is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum (p <0.05), but does not differ significantly from the mean IGF-1 concentration of all other foods serum levels (p> 0.05).
- The mean concentration of IGF-1 in papaya in serum is significantly lower than the mean concentration of IGF-1 in cow's milk and fish in serum (p <0.05), but does not differ significantly from the mean IGF-1 concentration of all other foods serum levels (p> 0.05).
- The mean serum IGG1 concentration in the serum is significantly lower than the mean IGG1 concentration of cow's milk, fish and wheat in serum (p <0.05), but does not differ significantly from the mean IGG1 concentration of all the other foods tested in serum (p> 0.05).
- Mean serum IGG1 concentration in serum is significantly lower than the mean IGG1 concentration of cow's milk, fish and wheat in serum (p <0.05) but does not differ significantly from the mean IGG1 concentration of all the other foods tested in serum (p> 0.05).
- The mean serum IGG1 concentration in the serum is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum and significantly

higher than the mean concentration of IGF-1 in serum ($p < 0.05$), but does not differ significantly from the mean IGG1 concentration of all other foods screened in serum ($p > 0.05$).

- The mean concentration of IGF-1 in whey is significantly lower than the mean concentration of IGG-1 in cow's milk, fish, shrimp, soybeans, wheat and corn in serum ($p < 0.05$), but not differs significantly from the mean IGG1 concentration of all other foods screened in serum ($p > 0.05$).

IGG1 in serum ($p < 0.05$), but does not differ significantly from the mean IGG1 concentration of all other foods screened in serum ($p > 0.05$).

- Mean serum IGG1 concentration in serum is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum ($p < 0.05$) but does not differ significantly from the mean IGG1 concentration of all other foods serum levels ($p > 0.05$).

- Mean serum IGG1 concentration in serum is significantly lower than the mean IGG1 concentration of cow's milk and fish in serum and significantly higher than the mean IGF-1 concentration of serum cocoa ($p < 0.05$), but does not differ significantly from the mean IGG1 concentration of all other foods screened in serum ($p > 0.05$).

- Mean serum IGG1 concentration in Whey is significantly lower than the mean IGG1 concentration of cow's milk and fish in Whey and significantly higher than the mean concentration of IGG1 of banana, tomato and cocoa in Whey ($p < 0, 05$), but did not differ significantly from the mean IGG1 concentration of all other foods screened in serum ($p > 0.05$).

Quadro 9. Comparação da concentração de IGG1 na Saliva entre os alimentos

Table 9. Comparison of IGF-1 concentration in Saliva between foods

Parâmetro	Alimento	n	Média	Intervalo de confiança (95%)		p‡
				Limite inferior	Limite superior	
IGG1 na Saliva	Leite de vaca	36	0,333 (0,067)[a]	0,310	0,355	< 0,001
	Peixe	36	0,391 (0,081)[b]	0,364	0,418	
	Camarão	36	0,198 (0,042)[c,d]	0,184	0,212	
	Ovo	36	0,182 (0,045)[c,d]	0,167	0,198	
	Soja	36	0,201 (0,045)[c,d]	0,186	0,216	
	Trigo	36	0,221 (0,051)[c]	0,204	0,238	
	Castanha	36	0,204 (0,051)[c,d]	0,187	0,221	
	Amendoim	36	0,178 (0,047)[c,d]	0,162	0,193	
	Kiwi	36	0,169 (0,044)[d]	0,155	0,184	
	Mamão	36	0,183 (0,076)[c,d]	0,157	0,209	
	Banana	36	0,191 (0,049)[c,d]	0,174	0,207	
	Tomate	36	0,197 (0,057)[c,d]	0,178	0,216	
	Milho	36	0,186 (0,047)[c,d]	0,170	0,202	
	Cacau	36	0,165 (0,105)[d]	0,129	0,200	

Legenda: ‡ - teste ANOVA. Letras iguais indicam que não há diferença significativa e letras diferentes indicam que há diferença significativa entre os grupos segundo o teste de Tukey. Valor de p considerado significativo menor ou igual a 0,05.

Comentário do quadro 9:

- A concentração média de IGG1 do leite de vaca na Saliva é significativamente menor que a concentração média de IGG1 do peixe na Saliva, mas é significativamente maior que a concentração média de IGG1 de todos os outros alimentos pesquisados na Saliva ($p < 0,05$).

- A concentração média de IGG1 do peixe na Saliva é significativamente maior que a concentração média de IGG1 do leite de vaca na Saliva, mas é significativamente maior que a concentração média de IGG1 de todos os outros alimentos pesquisados na Saliva ($p < 0,05$).

- A concentração média de IGG1 do camarão na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva ($p < 0,05$), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva ($p > 0,05$).

- A concentração média de IGG1 do ovo na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva (p <

0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).

- A concentração média de IGG1 da soja na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).
- A concentração média de IGG1 do trigo na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva e maior que a concentração média de IGG1 do kiwi e cacau na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).
- A concentração média de IGG1 da castanha na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).
- A concentração média de IGG1 do amendoim na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).
- A concentração média de IGG1 do kiwi na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca, peixe e trigo na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).
- A concentração média de IGG1 do mamão na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).
- A concentração média de IGG1 da banana na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).
- A concentração média de IGG1 do tomate na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva (p

< 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).

- A concentração média de IGG1 do milho na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca e peixe na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).

- A concentração média de IGG1 do cacau na Saliva é significativamente menor que a concentração média de IGG1 do leite de vaca, peixe e trigo na Saliva (p < 0,05), mas não difere significativamente da concentração média de IGG1 dos outros alimentos pesquisados na Saliva (p > 0,05).

Comment of table 9:

-The mean IGG1 concentration of cow's milk in Saliva is significantly lower than the mean IGG1 concentration of the fish in Saliva, but it is significantly higher than the mean IGG1 concentration of all the other foods surveyed in Saliva (p <0.05).

-The mean IGG1 concentration of the fish in Saliva is significantly higher than the mean IGG1 concentration of cow's milk in Saliva, but it is significantly higher than the mean IGG1 concentration of all other foods surveyed in Saliva (p<0.05).

- The mean IGG1 concentration of shrimp in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).

- The mean IGG1 concentration of the egg in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).

- The mean IGG1 concentration of soybean in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).

- The mean IGG1 concentration of wheat in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva and higher than the

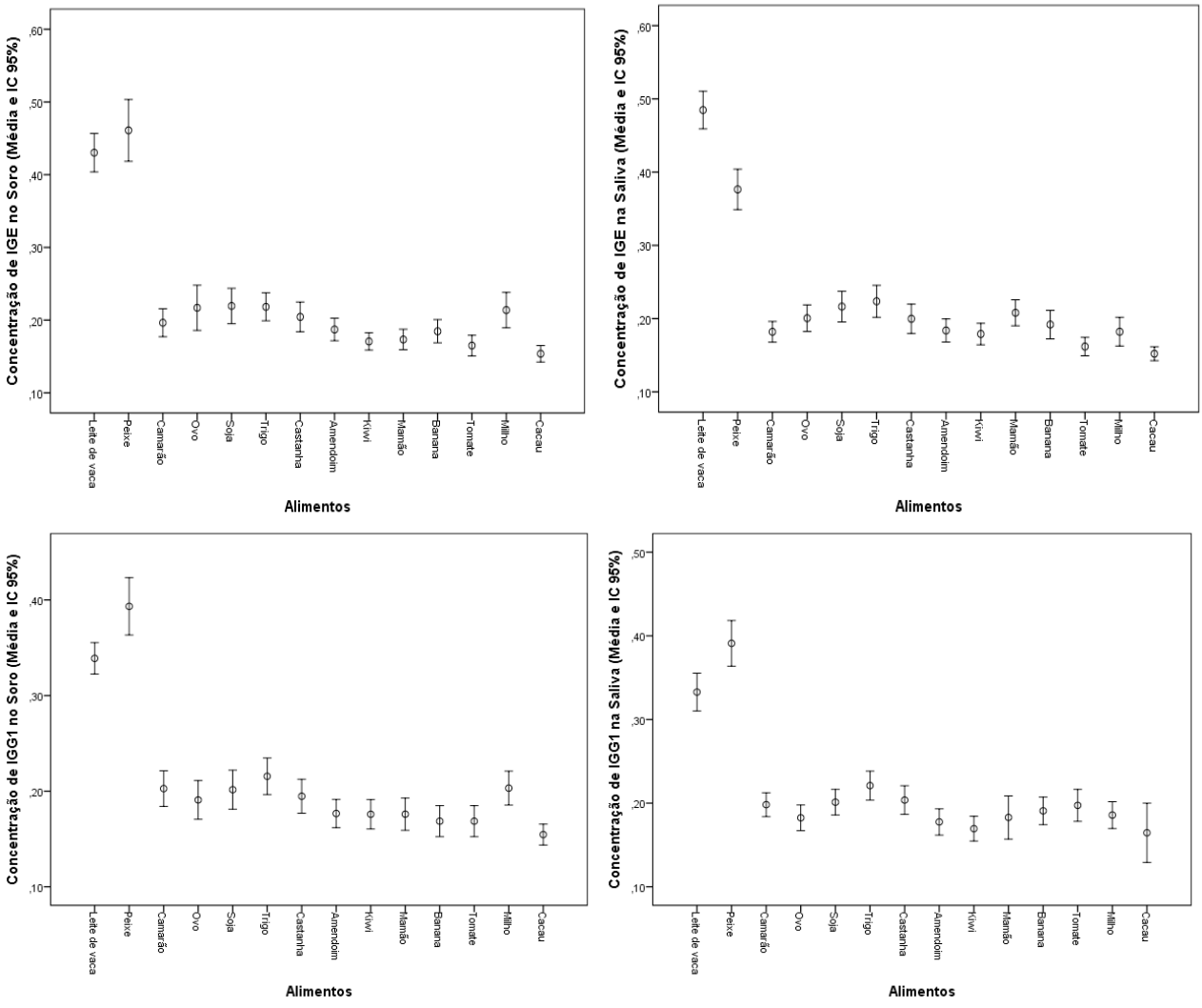
mean IGG1 concentration of kiwi and cacao in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).

- The mean IGG1 concentration of the chestnut in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).
- The mean IGG1 concentration of peanut in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).
- The mean IGI concentration of kiwifruit in Saliva is significantly lower than the mean IGG1 concentration of cow, fish and wheat milk in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods in Saliva (p> 0.05).
- The mean IGG1 concentration of papaya in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).
- The mean IGG1 concentration of banana in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).
- The mean IGG1 concentration of tomato in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods researched in Saliva (p> 0.05).
- The mean IGG1 concentration of corn in Saliva is significantly lower than the mean IGG1 concentration of cow's milk and fish in Saliva (p <0.05), but does not differ significantly from the mean IGG1 concentration of the other foods surveyed in Saliva (p> 0.05).
- The mean IGG1 concentration of cocoa in Saliva is significantly lower than the mean IGG1 concentration of cow, fish and wheat milk in Saliva (p <0.05), but

does not differ significantly from the mean IGG1 concentration of the other foods in Saliva (p> 0.05).

Figura 1. Concentração de IGE no soro, IGE na saliva, IGG1 no soro e IGG1 na saliva dos 14 alimentos pesquisados

Figure 1. Concentration of GGE in serum, GGE in saliva, serum IGG1 and IGG1 in the saliva of the 14 foods researched



Comentário da figura 1:

Na figura 1 acima estão apresentados os gráficos de barras de erros com a média e intervalo de confiança de 95% das concentrações de IGE no soro, IGE na saliva, IGG1 no soro e IGG1 na saliva para cada um dos alimentos pesquisados.

Os valores de média e os intervalos de confiança de 95% das variáveis IGE no soro, IGE na saliva, IGG1 no soro e IGG1 na saliva estão descritos nos quadros 6, 7, 8 e 9, respectivamente.

Para o melhor entendimento de como poderão ser interpretadas as barras dos gráficos, será colocada abaixo a interpretação da barra referente a concentração de IGE no soro, IGE na saliva, IGG1 no soro e IGG1 na saliva do leite de vaca.

Com uma confiança de 95%, a média da concentração de IGE do leite de vaca no soro é 0,430, e se encontra dentro do intervalo de 0,404 a 0,457. Com uma confiança de 95%, a média da concentração de IGE do leite de vaca na saliva é 0,485, e se encontra dentro do intervalo de 0,459 a 0,510. Com uma confiança de 95%, a média da concentração de IGG1 do leite de vaca no soro é 0,339, e se encontra dentro do intervalo de 0,323 a 0,355. Com uma confiança de 95%, a média da concentração de IGG1 do leite de vaca na saliva é 0,333, e se encontra dentro do intervalo de 0,310 a 0,355.

Comment of figure 1:

In figure 1 above the bar graphs of errors with the mean and 95% confidence interval of the concentrations of serum GGE, salivary GI, serum IGG1 and IGG1 in saliva for each of the foods investigated are presented.

The mean values and the 95% confidence intervals of the serum GGE, GGE in saliva, serum IgG1 and IGG1 in saliva are described in Tables 6, 7, 8 and 9, respectively.

For a better understanding of how the bars of the graphs can be interpreted, the interpretation of the bar referring to the concentration of GGE in the serum, IGE in the saliva, IGG1 in the serum and IGG1 in the saliva of the cow's milk will be placed below.

At 95% confidence, the mean serum GI concentration of cow's milk is 0.430, and is within the range of from 0.404 to 0.457. At 95% confidence, the mean GI concentration of cow's milk in saliva is 0.485, and is in the range of 0.459 to 0.510. At a 95% confidence level, the mean IGG1 concentration of cow's milk in serum is 0.339, and is in the range of 0.323 to 0.355. At a 95% confidence level, the mean IGG1 concentration of cow's milk in saliva is 0.333, and is within the range of 0.310 to 0.355.

TERMO DE CONSENTIMENTO LIVRE ESCLARECIDO
Universidade Estadual do Ceará – UECE
Centro de Ciências da Saúde – CCS
Mestrado em Nutrição e Saúde

ESTAMOS CONVIDANDO SEU/SUA FILHO (A) PARA PARTICIPAR DA PESQUISA intitulada**: PADRONIZAÇÃO DE TESTE DIAGNÓSTICO PARA ALERGIA ALIMENTAR EM CRIANÇAS. Esclareço que:** As informações coletadas somente serão utilizadas para os objetivos da pesquisa. O Senhor ou a Senhora tem a liberdade de desistir a qualquer momento de permitir que seu filho participe da pesquisa. Esclarecemos também, que as informações ficarão em sigilo e que seu anonimato será preservado. Em nenhum momento o senhor (a) ou seu filho terão prejuízo no tratamento e /ou financeiro. Informamos, que a participação da pesquisa não implica em riscos podendo o (a) Sr. (a) recusar-se a participar sem nenhum tipo de penalização ou qualquer prejuízo.

Objetivo Geral: Padronizar uma técnica sorológica para diagnostico de reações alérgicas utilizando o soro e saliva. **Metodologia:** Serão coletados 3mL de sangue e colocado em tubo sem heparina, e também de saliva (quantidade existente no Salivet). No laboratório de análise da UECE será centrifugada e armazenada em temperatura adequada (- 40º C). Os antissoros dos pacientes serão submetidos a teste de ELISA indireto (Enzyme Linked Immunosorbent Assay) para detecção de IgE e IgG1. Para esse ensaio, as placas serão sensibilizadas com diferentes alimentos (3µg/orifício). Os antígenos (alimentos) serão diluídos em tampão de carbonato de sódio 50 mM, pH 9,6, sendo usado 100 µl em cada poço. As placas serão incubadas 'overnight' a uma temperatura de 4°C, e em seguida, o soro de cada paciente suspeito de reações alérgicas será utilizado como anticorpo primário. **Benefícios:** As crianças participantes pesquisa, serão beneficiados pela análise de quais alimentos estão propensas a desencadear reações alérgicas. **Riscos e desconfortos esperados:** O risco e desconforto gerado pela pesquisa será a coleta de sangue, porém será minimizado por aproveitar o mesmo procedimento de rotina solicitado pelas gastropediatras do ambulatório bem como sangue ser coletado por enfermeira do próprio hospital. Os pesquisadores não identificam qualquer outro risco para seu filho e sua família. Importante dizer que a pesquisa atenderá a resolução 466/12 II.2.3 do Conselho Nacional de Saúde de 12 de Dezembro e 2012, a qual garante assistência integral as complicações e danos decorrentes, direta ou indiretamente, da pesquisa. **Acesso aos resultados:** Todo participante da pesquisa poderá ter acesso periódico aos resultados relevantes obtidos, pois após a conclusão da dissertação a ser elaborado com os dados obtidos, o mesmo será submetido a direção do hospital para aprovação e estará a disposição das famílias das crianças participantes. A pesquisa seguirá todas as normas e diretrizes da resolução 466 do Conselho Nacional de Saúde de 12 de Dezembro e 2012.

Se houver dúvidas sobre a ética da pesquisa entre em contato com o Comitê de Ética em pesquisa do Hospital Albert Sabin, Rua Tertuliano Sales, 544 – Vila União - CEP: 60410-790, Fortaleza – Ceará ou Fone: (85) 3101.4200.

Sendo necessário contatar com os pesquisadores responsáveis escreva ou telefone para:

Pesquisador: Maria Izabel Florindo Guedes. Telefone: (85) 8807.4003
Pesquisador: Marília Porto Oliveira Telefone: (85) 8818.1221

Gostaríamos de colocar que sua participação será de extrema importância para esse trabalho. Dados do entrevistado:

Nome:_____**RG:**_____

Endereço:_____**Tel:**_____

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Representante Legal Pesquisador

TRANSLATION

CLOSED FREE CONSENT TERM
State University of Ceará - UECE
Health Sciences Center - CCS
Master in Nutrition and Health

WE ARE INVITING YOUR / YOUR CHILD TO PARTICIPATE IN THE RESEARCH entitled: DIAGNOSTIC TEST STANDARDS FOR FOOD ALLERGY IN CHILDREN. I clarify that: The information collected will only be used for the purposes of the research. You are free to give up at any time to allow your child to participate in the survey. We also clarify that the information will be kept confidential and that its anonymity will be preserved. At no time will you or your child be injured in the treatment and / or financial. We inform you that the participation of the research does not imply risks and you can refuse to participate without any kind of penalty or any loss.
Objective: To standardize a serological technique for the diagnosis of allergic reactions using serum and saliva. Methodology: 3mL of blood will be collected and placed in a tube without heparin, and also saliva (Salivet amount). In the analysis laboratory of the UECE will be centrifuged and stored at a suitable temperature (- 40 ° C). Patients' antisera will be submitted to indirect ELISA (Enzyme Linked Immunosorbent Assay) for IgE and IgG1 detection. For this assay, the plates will be sensitized with different foods (3μg / well). The antigens (food) will be diluted in 50 mM sodium carbonate buffer, pH 9.6, using 100 μl in each well. The plates will be incubated overnight at a temperature of 4 ° C, and then the serum of each patient suspected of allergic reactions will be used as the primary antibody. Benefits: The children participating in research will benefit from the analysis of which foods are prone to trigger allergic reactions. Risks and discomforts expected: The risk and discomfort generated by the research will be the collection of blood, but will be minimized by taking advantage of the same routine procedure requested by the ambulatory gastropediatricians as well as blood being collected by the hospital's own nurse. Researchers do not identify any other risk to their child and family. It is important to state that the research will comply with Resolution 466/12 II.2.3 of the National Health Council of December 12, 2012, which guarantees full assistance for complications and damages arising directly or indirectly from the research. Access to the results: Every research participant may have periodic access to the relevant results obtained, because after the conclusion of the dissertation to be elaborated with the data obtained, it will be submitted to the hospital management for approval and will be available to the families of the participating children . The research will follow all the guidelines and guidelines of Resolution 466 of the National Health Council of December 12 and 2012.

If there are doubts about the research ethics, contact the Research Ethics Committee of the Albert Sabin Hospital, Rua Tertuliano Sales, 544 - Vila União - CEP: 60410-790, Fortaleza - Ceará or Phone: (85) 3101.4200.

If you need to contact the responsible researchers write or call:
Researcher: Maria Izabel Florindo Guedes. Phone: (+5585) 8807.4003
Researcher: Marília Porto Oliveira Phone: (+5585) 8818.1221

We would like to point out that your participation will be extremely important for this work. Data of the interviewee:

Name: _____ ID: _____

Address: _____Phone: _____

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Legal Representative Researcher

SUPPLEMENTARY MATERIAL 1

EXAMINATION OF FOOD HYPERSENSITIVITY

NAME:_____READER:_____

DATE OF BIRTH:_____CURRENT AGE:_____

MOTHER:_____

FATHER:_____

PHONE:_____DATE:_____/_____/_____

BREASTFEEDING: ( ) YES, EXCLUSIVE UNTIL_____
MISTA UNTIL:_____
( )NO

MAIN COMPLAINT:.....
CURRENT DISEASE HISTORY
_____
_____

MARCAR COM UM X.....

DISEASE	AGE	UNLEASHING	REATMENT OU DIET
URTICARIA			
ANGIODEMA			
DERMATITIS			
VOMITING			
DIARRHEA			
ABDOMINAL PAIN			
LOW WEIGHT GAIN			
BLEEDINGS			
LARINGITES			
OTHERS			

CO-MORBIDITIES:
_____
_____
_____

OTHER ALLERGIES:
_____
_____
_____

FAMILY BACKGROUND:

MOTHER:_____

FATHER:_____

BROTHERS:_____

FOOD HISTORY

INTRODUCTION OF SOLIDS:_____

CURRENT DIET:

BREAKFAST:_____
SNACK:_____
LUNCH:_____
SNACK:_____
DINNER:_____
OTHERS:_____

PHYSICAL EXAM

WEIGHT:_____PERCENTILE:_____
STATURE:_____PERCENTILE:_____
TURGOR:_____
CUTANEOUS
DPUBLES:_____
CIRCUNFERENCES:_____

LABORATORY EVALUUATION:

IgE:
IgA:
Ac Anti-transglutaminase:
Ac Anti-gliadina:
Ac Anti-endomisio:
Rast para alimentos ou PICK:
Alfa-1-antitripsina:
Bx com contagem de eosinófilos:
Bx com contagem de eosinófilos:
EDA:
COLONOSCOPY:
PHMETRIA:
OTHERS:

CONDUCT:_____
_____

RETURN DATE: _____