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Identification Of Carbohydrate, Protein And Fat Levels In Flour, Cheese, Milk And Yoghurt Through Several Test Methods

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ABSTRACT

Food is incoming substance to in body human and processed in a manner chemical and biological like carbohydrates , proteins, and fats. each of third substance this have very important role for body . Carbohydrate useful as one source energy , increase the sweet taste , regulate the process of glucose blood , and can solve fatty acids. Proteins play a role in metabolic processes , catalysts enzymatic , antibody , and carrier signal in a manner biological . Useful fat as warmer body , adjustment with change temperature , and protect body from crash . For knowing how much many content of fat , protein, and carbohydrates contained in a food or drink so need done testing in a manner qualitative and quantitative , testing this depending on the sample being tested and the effect temperature nor ingredient standard used . The purpose of the literature review is to determine and compare the levels of carbohydrates, proteins and fats in samples of flour, milk, cheese and yogurt through various test methods.

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1. INTRODUCTION

Definition food is incoming substance to in body human and processed in a manner chemical and biological like carbohydrates , proteins, and fats. Healthy food generally contain nutrition balanced in accordance with nutritional plate balanced according to the Ministry of Health of the Republic of Indonesia. nutrition balanced must fulfill the five necessary substances is inside body These include carbohydrates, fats, proteins, water and vitamins. Fifth substance this considered urgent because supported by four influencing factors body like Fulfill adequacy calories per day , together habit behavior life clean and healthy if our environment eat surrounding clean as well as free from microorganisms so incoming food to in body Becomes healthy also instead , do activity physical like exercising around House nor inside house , food consumed no exceed limit carbohydrates and fats per day for guard ideal and normal body weight so as not to occur obesity (Andriyani , 2019).

Carbohydrate is aldehyde or ketones polyhydroxides containing carbon , oxygen and hydrogen atoms as well as have formula empirical Cx (H2O)y. Utility carbohydrate for body as one source energy , increase the sweet taste , regulate the process of glucose blood , and can solve fatty acids. one source frequent carbs used is flour . Flour usually made from grain and use as ingredient base making noodles , bread and cakes . There is three type flour These include hard flour, medium flour and soft flour . Difference from third type flour This is due to the protein content in it . The more gentle texture flour , then will the more small content the protein (Yunianto , 2021).

Definition of protein itself is most macromolecules in body creature live . Proteins consist from linked amino acids through bond peptides , meanwhile amino acids are formed from amino group with group carboxyl . There are also chains side different amino acids (R-) will produce different amino acids

too. Proteins play a role for body in metabolic processes , catalysts enzymatic , antibody , and carrier signal in a manner biology (Yuliana, 2018). Source of vegetable protein could originate from product results fermentation like tempeh and yogurt . Tempeh is product fermentation from peanut soya bean with mold Purposeful Rhizopus for reduce amount of protein to be form amino acids, so more easy for metabolized in body . Yogurt is product results fermented milk and bacteria kind to the body like Lactobacillus bulgaricus and Streptococcus thermophilus . Addition bacteria aim for Upgrade smooth in system digestion body (Sasono , 2021).

The last macromolecule ie fat is substances that are not late in water and is non-polar. Lipids consist of fatty acid esters with chain different side, so have simple lipids, compound lipids , and their derivatives phospholipids . Useful fat inside body as warmer body, adjustment with change temperature , and protect body from collision (Yuliana, 2018). Fat can originate from animal and vegetable, a significant difference is animal fat obtained from animal while vegetable fat obtained from plant . Frequent animal fats used is milk and cheese as well as frequent vegetable fats consumed form nuts and oil (Nurliyani , 2021). Based on description the macromolecules present in body, got counted levels of fat, protein, and carbohydrates through analysis proximate based on available SNI guidelines . The content of fat, protein, and carbohydrates present depending on the sample being tested and the effect temperature nor ingredient standard used.

2. METHOD

Applied method in arrange *reviews* journal this is study literature with source taken that is originate from https://scholar.google.com/ and https://www.google.co.id/ . Journals , articles , and guides to be choice reference maximum 10 years before . Whereas regulation book used related macromolecules in body obtained through https://www.google.co.id/books/ . Besides that criteria other using keywords fat content, protein content , content carbohydrates , and analysis proximate . After get 24 journals which is almost enter criteria such , only there are 21 correct journals in accordance with topics as well as the theme raised .

3. RESULTS AND DISCUSSION

Table 1. Results

NO.	SOURCE	TEST SAMPLE	METHOD	RESULTS
1.	(Barokah et al., 2018)	Cheese	BAL Starter Method	Cheese vegetable made from base peanut resulting arrears contains fat low with difference that is not too away on each the treatment .
2.	(Estikomah , 2017)	Cheese (Cheddar)	Bacteria starter method	Quality cheddar cheese on K1B3 (100% cow 's milk with using 100% Rhizopus starter oryzae) produces the lowest fat content 21.86% meanwhile highest fat content on quality K3B1 cheddar cheese (100% goat 's milk with starter 100% Streptococcus lactis) which is 59.53%
3.	(Musrorah , H., 2018)	Cow 's milk (dairy)	Method Centrifugation	Research results show that no difference significant influence speed round centrifugation to density , pH and viscosity . However there is influence round speed centrifugation to separated

				fat content . The more tall temperature storage accompanied enhancement speed round centrifugation , then the more tall the fat content inseparable .
4.	(Novianti et al., 2018)	Cheese (no branded)	Method Mojonniers	Test results sample A fat of 28.80% and 18.19% in sample B. The quantity of fat in both sample cheese far more low from quantity fat that has set in accordance with SNI namely by 48%.
5.	(Oka et al., 2018)	Milk	Gerber method	Rate the fat not yet Fulfill Indonesian National Standard with fresh milk fat content obtained still below fat content the minimum is 3.0%.
6.	(Serlahwaty et al., 2015)	Milk	Method Soxhletasi	Fat content in peanut milk soya bean range between 0.6% - 0.7% and fat content in milk peanut soya bean fermentation range between 0.1% - 0.2%. this caused During fermentation , fat will hydrolyzed Becomes more compounds simple . Hydrolysis triglycerides by lipase enzymes will produce fatty acids and glycerol .
7.	(Sigit et al., 2021)	Cow 's milk (fresh)	Method Lactosan	The average value of the fat content that comes from Kediri City is 2.9525 ± 0.41823% and the average fat content derived from Kediri Regency is 3.2860 ± 1.25820%. Highest fat content originate from Regency Kediri is located on SNI standards namely with a mean of 3.2860 ± 1.25820% and value the average fat content of the City of Kediri is under SNI standards .
8.	(Khanifah , 2018)	Tempeh	Method *UV-VIS Spectroscopy* , *Enhanced Dumas* , and Kjeldahl	Highest total protein content in the mixture tempeh soy and pineapple without fermentation with composition of 1:3 worth 31.28%. The highest total protein content in the mixture tempeh soy and pineapple with fermentation at a composition of 1:2 worth 36.51%.
9.	(Amanah et al., 2019)	Tempeh	Method Kjeldahl	Formulation benguk koro tempeh with substitution peanut soya bean black (B20:H80) gives rate

				highest protein ie 17.84% and the most texture soft i.e. 1.53mm
10.	(Nareswary & Andaka , 2017)	Tempeh	Method Kjeldahl	Protein content in seed jackfruit experience enhancement after seed jackfruit made Becomes tempeh , that is from 4.2% to 5.96% tempeh seed jackfruit with yeast weight 1 gram and time 48 hours of fermentation .
11.	(Jubaidah et al., 2016)	Tempeh	Method Spectrophotometry ray looked	Corn tempeh with combination soya bean ratio V (20:80) g was obtained rate highest by 14.8%.
12.	(Orchid et al., 2018)	Yogurt	semi- micro method kjeldahl	Yogurt protein content results with peanut milk formulation tolo and cow 's milk i.e. 3.89%
13.	(Romsiah & Purnamasari , 2019)	Yogurt	Method Kjeldahl	Protein content of each yogurt packaging sold at Hypermart city Palembang that is sample 1 : 2.84%, sample 2 : 1.94%, sample 3 : 1.59%, sample 4 : 2.73%, sample 5 : 2.85%, and sample 6 : 1.98%.
14.	(Purwantiningsih et al., 2022)	Yogurt	Method Kjeldahl	Yogurt made of 2 types bacterial cultures (Lactobacillus bulgaricus and Streptococcus thermophilus) produces yogurt with fat content and protein content best . The combination A2B1 yields yogurt with protein content and best fat content valued at 4.476% ± 0.01650.
15.	(Rahmawati et al., 2020)	Milk (Formula and Fermentation)	Method Iodometry (Luff Schoorl) and *Independent t-test*	Rate average lactose (carbohydrates) in formula milk and fermented milk were 22.063% and 9.964%, respectively . Calculation results obtained the number t count is 11,623 while the t-table 2.101. This shows t count more big from t table. It means that Ho is rejected and Haha accepted that is exists that difference significant Among rate lactose in Milk Formula and Fermented Milk .
16.	(Hardiansyah , 2020)	Kefir	Method Calculation rough (*Proximate analysis* or *Carbohydrate by difference*)	Research results show there is 5.53% carbohydrates or 5.53 grams carbohydrate in 100 grams of kefir. this show that in 5.53% carbohydrates the there is fiber and nitrogen - free materials , of course , too there is lactose as component

				carbohydrate main and some sour lactate that has fermented .
17.	(Utama et al., 2019)	Wheat and flour sprouts corn	Method *Carbohydrates by difference*	Content carbohydrate flour sprouts corn by 73.23%, more tall compared to flour which is only 72.28%. Treatment ratio of 30% flour with 70% flour sprouts corn produce flakes with characteristics best that is there is mark rate carbohydrate 68.08%.
18.	(Suparmi et al., 2021)	Flour sago and flour shrimp rebon	Method *Carbohydrates by difference*	Product carbohydrate content macaroni flour sago with fortification flour shrimp rebon MS0 (76.99%), MS1 (65.65%), MS2 (65.99%), MS0 treatment has mark carbohydrate highest compared to treatment other . However , third treatment the have still value _ in standard SNI value minimum 60%.
19.	(Sabir et al., 2020)	Flour Wheat with Flour Dregs Know	Method *Carbohydrates by difference*	Analysis results Carbohydrate show treatment A (flour 75% flour + flour dregs know 25%) with rate carbohydrate highest of 75.45% and treatment C (flour wheat 25% + flour dregs know 75%) with rate carbohydrate Lowest of 72.70%.
20.	(Dewi et al., 2019)	Powdered milk sprouts soya bean instant	Proximate Analysis Method	Grade value carbohydrate highest in concentration maltodextrin 5% by 59.4% and the lowest at a concentration of 10% by 43.9%.
21.	(Qalsum et al., 2015)	Flour seed mango type gadung	Method Phenol sulfate	Obtained carbohydrate content from flour seed mango without through Step sulfurization namely 20.00%, composition carbohydrate by 13.89%.

Fat is a bunch molecule composed nature on element carbon , hydrogen , oxygen which includes fatty acids, sterols, wax , some soluble vitamins in fat (Ancient *et al* , 2021). There is various type method used in determine fat content ie method soxhlet , method mojonnier , method folch , method bobcock , goldfish method (Santoso *et al,* 2020). In a journal review this , there is difference in use method as well as materials used at the time testing such as fat content method with BAL starter, Method centrifugation , Method mojonnier , Method gerber , Method soxhletation , Method lactosan . Materials used for testing such as milk and cheese . one frequent method used namely Starter BAL or (Bacteria Sour lactate) which is method microbiology with the risk of the media used for grow BAL can contain extract yeast (*yeast extract)* (Kusuma & Kurniawati , 2021). Method mojonnier have principle like oil or free fat from sample form fluid with treatment using NH4OH and ethanol then dissolved in mixture diethyl ether -petroleum ether . Layer ether decanted then entered to aluminum cup . After that ether evaporated and weighed Cup containing oil . Method soxhlet have principle like the fat in the extract with nonpolar solvent in Suite tool soxhlet which consists from pumpkin boiling , place extraction , and condenser .

According to Novianti et al (2018), the quantity of fat in sample A is 27.80% and sample B has value 18.19%. From the results it is known that quantity of fat from 2 samples cheese the more low compared to from normal value that has been stipulated by SNI for type cheddar cheese , that is by 48%. Low fat quantity suspected because exists warmup so that cause happening fat oxidation . this resulted fat content in cheese reduced . Use Acid also has an effect to due to low fat sour could cause happening fat hydrolysis . it capable reduce fat content in cheese

Estikomah (2017) said in results his research that do the cheese starter test an active culture from growing non - pathogenic microorganisms in milk or whey that plays a role in formation characteristics and qualities specific to the product cheese . The results of the highest fat content were in the K3B1 treatment with level of 59.53% which is treatment using 100% goat's milk with 100% Streptococcus lactis starter, amount of trapped fat in curd influenced the fat content of the milk used as ingredient default . Added Goat milk fat content more tall from cow 's milk . Bacterial starter added at manufacture cheese will do three activity urgent that is , (1) glycolysis , that is change lactose Becomes sour lactate ; (2) proteolysis , ie protein breakdown more substance simple like peptones , amino acids, etc.; and (3) lipolysis , ie hydrolysis fatty acids from milk fat, lipolysis responsible answer or formation of taste and aroma. Making starters with liquid skimmed milk method 2000 ml divided into 2 parts in the glass beakers of 1000 ml each and labeled S and R, glasses beaker S is inoculated with Streptococcus lactis whereas glass beaker R is inoculated with Rhizopus oryzae (Radriyo , 2006).

Proteins are molecule polypeptide that has chain long arranged of monomers in the form of amino acids and spliced with bond peptide (Ancient et al , 2021). Proteins are a group characteristic biomacromolecules heterogeneous however when outside creature life or cells , protein is difficult for stable . More protein size big than peptides (Nugroho & Rahayu , 2018). Proteins have bond peptide from amino acids needed by the body. Different types of proteins Becomes two namely animal protein and vegetable protein. In analysis qualitative there is a biuret test, Millon test, ninhydrin test, meanwhile analysis quantitative there is method kjeldahl, biuret method (quantitative), method lowry- follin, method bradford , method UV absorption (Santoso et al, 2020). The most frequent method used is method kjeldahl is method that can determine the total nitrogen present in the material food then converted to rate the protein so that all the nitrogen is measured and considered from proteins. In a journal review this , there is difference in use method as well as materials used at the time testing such as fat content method UV-VIS Spectroscopy, Methods enhanced dumas, Method kjeldahl , Method spectrophotometry ray looked , Method semimicro kjeldahl . Materials used for testing form tempeh and yogurt.

According to Khanifah (2018), total protein levels in tempeh fermentation peanut soybean (Glycine max L. Merr). and extract stem pineapple fruit (Ananas comosus) use method Kjeldahl which is measurement protein content with 3 stages that is digestion, distillation, and titration. Method this more easily and universally compared method other. every addition ratio composition extract pineapple stem then total protein levels increased. Addition Extract pineapple stem vs straight with total protein content in each composition. increase in protein in total protein content in tempe without fermentation occur because tempeh protein hydrolysis process peanut soybeans by enzymes bromelain in the extract stem pineapple. Hydrolysis occur when enzyme break down proteins into fractions boosting peptide protein content in it. While the total protein content in tempe fermentation with 48 hours have different results with hydrolysis. Occur decline related with activity of Rhizopus sp which denatures tempe protein. There is addition extract stem pineapple fruit 3x from the initial volume will make ingredient sufficient water content tall so that the process of protein denaturation by fungi in tempeh fast happened.

In research by Amanah et al. (2019), Influence results time fermentation state that rate nutrition tempeh seed jackfruit with ingredient raw seed jackfruit 100 gram yeast and 1 gram weight initially occur trend over time fermentation so protein levels obtained the more big however after past 48 hours occurs decline protein levels. Influence results yeast weight stated that rate nutrition tempeh seed jackfruit with ingredient raw seed jackfruit 100 grams and time fermentation for 48 hours have trend the more lots of yeast used so the more decrease rate protein and tend constant with addition the leaven. Organoleptic analysis showed color white, taste and aroma enough delicious , texture soft and compact

. Likeability test showing that the most liked is tempeh seed jackfruit with yeast weight 1 gram and time 48 hours of fermentation.

Carbohydrate is ketones polyhydroxylation or aldehydes and their derivatives, including synthesized polymers and other compounds from aldehydes and ketones polyhydroxylase (Ancient et al, 2021). In determine rate carbohydrate could done using a qualitative test such as the Molisch test, Benedict's test, Barfoed 's test, Fehling's test, Selliwanoff's test, Iodine test, while the quantitative test is determination of reducing sugar, total sugar and sucrose, analysis amylose in starch with method colorimetry, Determination rate starch in sample flour rice and flour corn (Santoso et al, 2020). In a journal review this, there is difference in use method as well as materials used at the time testing such as fat content method Luff Schoorl, Proximate method or Carbohydrate by difference, Method phenol sulfate. Materials used for testing form Flour flour, kefir, powdered milk .

Carb content be measured with use method phenol sulfate. Principle from method this are simple sugars and oligosaccharides could react with phenol in sour sulfate concentrated produce color orange stable yellow. Where are the oligosaccharides hydrolyzed Becomes monosaccharides by acids sulfate dense and hydrating so that form reacting furfural compounds with phenol produce color orange yellowish. Application method phenol-sulfate many used for determine carbohydrate in sample in a manner directly stated as percent glucose. Study this state that flour fat content seed mango without sulfurization more high (14.83%) compared with flour used sulfurization (12.94%). this suspected because immersion with sodium bisulfite was carried out for 4 hours. The soaking time is quite long network cell more broken and with holes so deep fat cell diffuse out cell. Besides That is , the immersion process cause fat breakdown fatty acids so more many volatile fatty acids moment drying (Qalsum et al., 2015).

In trials conducted by Utama (2019), levels carbohydrate done with method Carbohydrate by different. Content Carbohydrate flakes experience enhancement with the more many use flour sprouts corn. Content carbohydrate flour sprouts corn by 73.23%, more tall compared to flour which is only 72.28% so with enhancement use flour sprouts corn cause rate The resulting flakes carbohydrates are also increasing increase. Based on results print variety show that ratio wheat with flour sprouts corn influential no real (P>0.05) to rate carbohydrate the resulting flakes. The highest flakes carbohydrate content obtained in treatment P5 (10% flour and 90% flour sprouts corn) namely 70.22%. Carb content Lowest obtained in treatment P1 (50% flour and 50% flour sprouts corn) namely 66.06%. The magnitude mark rate carbohydrate according to standard quality of flakes at least 6% wb (Anon., 1996) so the protein content of the flakes produced has Fulfill standard flakes quality.

4. CONCLUSION

Based on the journal review conducted, it can be seen that the proximate analysis can be determined quantitatively with the SNI (Indonesian National Standard) guidelines adjusted for the test sample. Proximate analysis can be carried out on test samples from both animal and vegetable origin, and the food can also be the result of fermentation from these two sources. However, later it will be distinguished again through the methods and processes in determining these levels. So that people can find foods that have been tested and can be consumed widely and meet adequate nutritional intake for children to the elderly.

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