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BOOK OF ABSTRACTS

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List of ABSTRACTS

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PLENARY SESSIONS

Policies and Programs to Prevent Stunting in Indonesia: How to Implement Them More Effectively

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Stunting a linear growth failure, is the most common form of chronic undernutrition globally, and the most significant impediments to human development. It has an effect on increased morbidity and mortality, reduced physical, neurodevelopmental and economic capacity, and an elevated risk of metabolic disease into adulthood. This review, assess the policies and programs of reducing stunting in Indonesia and propose a better implementation of the programs. Accelerating the improvement of community nutrition problem with a focus on reducing stunting (from 30.8% to 14.0%) is one of President Joko Widodo's priority policies as outlined in the National Medium-Term Development Plan, 2020-2024. At the national level, the policy and programs on stunting was placed strongly by involving 23 ministries and head of national agencies, as well as by allocating budget for selected high priority villages, sub districts and districts. The national strategy for stunting prevention was established by developing 5 pillars of stunting prevention, namely: commitment and vision of the highest state leadership; national campaigns that focus on improving knowledge, behaviour, political commitment and accountability; strengthen convergency, coordination and consolidation of national, regional and community programs; strengthen food and nutrition security policy; and monitoring and evaluation. To be more effective at the local levels, an integrated nutrition and health surveillance and intervention focused on young couple marriage and pregnant women at village, health centre, and district levels of the priority areas should be implemented well, in which the targets are normal body weight and normal haemoglobin level of pre-pregnant women, normal additional body weight for each trimester of pregnant women, and normal body length of new born infants. In addition, competence midwives and nutritionists are urgently required for each selected prioritized village.

Keywords: Indonesia, policies, programs, stunting, undernutrition.

Interactions between Bioactive Compounds in Foods and Their Functional Effects

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Abstract

A typical meal would include a combination of different vegetables. Coloured vegetables contain the respective pigments which are reflective of the different bioactive compounds present in them. There is continuing evidence in literature to indicate that these compounds which are predominantly different types of carotenoids and several phenolic acids present in fruits and vegetables. These compounds are usually co-ingested, co-digested and absorbed through the human digestive tract. They also exhibit protective effects against chronic conditions through functions such as anti-oxidation, anti-inflammatory properties. A study to understand the combined effects of these compounds on such properties was conducted using ex-vivo 2D cell culture models (caco2 cells). Foods containing carotenoids and anthocyanins were mixed to understand their interactions when co-digested and their bioaccessibility and cellular bioactivities. Red cabbage was co-ingested with carrot, cherry tomato or baby spinach in a 1:1 ratio on a fresh weight basis with or without the addition of any salad dressing to mimic a typical diet. The digested matrix using a simulated human digestion protocol showed that the total bioaccessible anthocyanins increased by 10-15%, but that of carotenoids decreased by 21-56% compared to when these vegetables were digested singly. However, the total carotenoids that were ultimately bioaccessible from the co-digested vegetables after intestinal cellular uptake was higher than that from the singly digested vegetables by 46-191%. The digestion of mixed vegetables resulted in an enhancement of the cellular antioxidant activity by 26-31% and the suppression of IL-8 secretion (marker for inflammation) by 27-65%.

Keywords: bioactive compounds, bioavailability, chronic diseases, fruits and vegetables.

Functional Foods and Obesity Prevention: Are There Sufficient Scientific Evidences to Link Them?

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Abstract

According to WHO, more than 1.9 billion adults (18 years and older) were overweight and over 650 million were obese in 2016. Obesity is a major public health problem and numbers are rising at a fast pace in ASEAN countries. It leads to non-communicable diseases and other co-morbidities e.g., diabetes, hypertension, cardiovascular diseases, osteoarthritis, stroke and inflammatory diseases. Obesity develops from excessive fat storage and adiposity of adipose tissue. Life-style, physical activity and diets are important factors in the management of obesity. There are food products in the diet that help the management of hunger or that increase satiety. Anti-obesity drug therapy complemented with diet therapy and physical activity has been widely used to treat obesity. Nowadays, the management of obesity by foods that having functional properties have drawn attention due to the potential side effects of obesity drugs. The food can be considered as 'functional' if it possesses constructive effects on target functions into the human organism, beyond nutritional effects, with aim of health promotion and wellbeing and/or the reduction of chronic diseases. Functional foods are attaining eminence globally and are part of our daily diets. There is interest in functional foods that could help in prevention and/or management of obesity. The available research supports evidence for the potential of functional foods in the management of obesity. In recent years, many animal studies, human clinical trials and epidemiological studies have been performed in order to investigate the possible effect of specific functional foods and their bioactive compounds on weight management. Most studies present some indications, but no clear evidence. In this presentation, author will focus on the effect of cocoa and cocoa products and their polyphenols on obesity management and prevention.

Keywords: functional foods, obesity, cocoa, polyphenols.

Nutrition Policy to Promote Healthy Eating for Everyone in a Changing Society in Japan

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Abstract

Japan is the longest-lived country in the world. And the rate of obesity is also low. However, the current health problem in Japan is an increase in lifestyle-related diseases. The reason for this is that dietary intake has increased lipids due to a decrease in cereals and an increase in animal foods such as meat. High salt intake is also a challenge. On the other hand, a new challenge for Japan is the widening socio-economic gap. Along with this, health disparities and diet disparities have also been reported. In this changing society, nutrition policies are necessary so that everyone can eat healthy. In Japan, healthy meals for Japanese people are being healthy dietary pattern for Japanese, promoted at the national, municipal, market, workplace, and school. As a population approach, we will introduce the following three initiatives. 1) Restaurants and supermarkets: Local governments have created a registration system for restaurants to provide healthy food, side dishes and meals in order to create a healthy eating environment; 2) Workplace: They are providing healthy meals at cafeteria and providing nutrition education for workers and doing nutrition management; 3) Schools: They provide healthy school lunches and conduct nutrition education using school lunch. They reduce disparity of nutrients intake among children among economic status. Here are two high-risk approaches. 1) Food bank: A private organization that provides food to economically needy households; 2) Local cafeterias: Local NPOs offer cheap and nutritious meals to people in need.

Keywords: changing society, healthy diet, nutrition policy, Japan.

Obesity Prevention and Control Policies in Thailand: from Nutrition Labelling and Sugary Drink Taxation to Banning Trans-Fat. How Successful Have They Been So Far?

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Abstract

Overweight, obesity and related diseases are leading public health problems for Thailand that require an appropriate food environment and efficient food and nutrition education. Simplified Front of Pack nutrition labelling and the Healthier Logo Program (HLP) have been implemented since 2015. The purposes of HLP are to encourage food industries to reformulate their food products to be healthier and change the purchasing behaviours of consumers so they can search for healthier products. Currently, 1850 products from 295 food companies are eligible to use the logo and 806 products containing the logo are available on the market. In 2019, the government enacted a sugar tax law in which industrially produced beverages containing more than 6% sugar are taxed at a much higher rate. However, most beverage products were prepared for this new tax law, since producers had already reformulated their products to meet HLP criteria. While HLP is voluntary and sugar taxation is mandatory, both activities must be implemented by involving different stakeholders from the private sector, academia and NGOs. Partnership is the key strategy for Thailand's policy to prevent and control obesity and related diseases. A best practice has been achieved, moreover, due to the success of the project "Thailand: trans-fat free country", which is a partnership between industry, regulators and academics that has been a major contributing success factor. Since obesity and related diseases are quite complicated, multidisciplinary and multi-stakeholder approaches are mandatory for efficient problem-solving.

Keywords: front of pack, sugar taxation, trans-fat.

COMMUNITY NUTRITION

Nutrition Modules Application on Physical Education to Increase Fruit and Vegetable Consumption among School Children

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Abstract

The lack of fruit and vegetable consumption behavior in Indonesia reached 93.50%. This condition had an impact on the development of obesity. Physical activities that done by sports lesson can upgrade physical fitness so obesity can be prevented. The study objective was to apply the nutrition modules on sports lessons in effort to increase fruit and vegetable consumption in students. This study method was quasi-experimental with a randomized pretest-posttest control group design. A sample number of (i.e. 60 subjects from Denpasar Indonesia and 60 subjects from Mataram Indonesia) was taken randomly and conducted for 3 months in two stages i.e. training of sports teachers using the nutrition modules and application of modules on sports lessons by teachers. Collected data were fruit and vegetable consumption using the 24-hour recall method and food frequency questioner, physical fitness using a physical test, and the students' knowledge using questionnaire which were carried out at the beginning and at the end of the intervention. Data analysis was performed using difference test, i.e. paired T-test and independent T-test. The result showed the increasing of average knowledge after the intervention Denpasar city (62.5±9.0), Mataram City (82.3±14.8), the average fruit and vegetable consumption Denpasar city (67.6 ± 9.0 g/day), Mataram city (81.8 ±14.8 g/day)) with difference significantly ($p \leq 0.05$), and the average level of physical fitness Denpasar city (4.1±0.6), Mataram city (4.6±0.7) with no significant difference ($p>0.05$). It was concluded that modules application on sports lessons can increase fruit and vegetable consumption in students. To foster child habit to consume fruit and vegetable, we need some support from the teacher and family of the child to support changing child behavior of consuming fruit and vegetable

Keywords: fruit and vegetable consumption, knowledge, nutrition module, physical education, students.

Carbohydrate Intake as a Dominant Factor of Underweight among Toddlers in Bogor District, Indonesia

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Summary

Globally, underweight contributes to at least half of the total annual deaths in toddlers. This study was performed to determine a dominant factor of underweight among toddlers in Bogor District, Indonesia. The design of this study was cross-sectional, using secondary data with a total sample were 612 toddlers. Chi-square test and multiple logistic regression were used to determine factors contributing to toddler underweight. The prevalence of underweight in toddlers in Bogor District, Indonesia in 2019 was 19.8%, and carbohydrate intake was found to be a dominant factor of underweight in toddlers (p-value<0.05; OR=2.45; 95% Cl=1.43-4.18).

Keywords: carbohydrate intake, cross-sectional, multiple logistic regression, toddler, underweight.

Consumers and Food Manufacturers' Preferences for Front-of-Pack Nutrition Labelling in Indonesia

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Summary

In Indonesia, front-of-pack (FoP) nutrition label is a voluntary action, which has potentials in improving consumers' understanding on nutrient profile of food products. This study assessed preference of the consumers and food manufacturers in Indonesia for type of FoP nutrition label. A cross-sectional study using questionnaire was conducted involving 400 consumers and 117 food manufacturers, with six types of FoP mock label presented. Consumers were interviewed while food manufacturers were surveyed online. The results indicated majority of consumers and small and medium enterprises preferred 'health tick' style, with energy, fat, sugar and salt deemed to be the most important information.

Keywords: front-of-pack label, healthier choice logo, nutrition fact, traffic light labeling.

Food Accessibility of Rice in Riau Province, Indonesia

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Abstract

Accessibility level of household to food is an absolute requirement to achieve community welfare. Rice is the staple food for people in Riau Province. Currently, 70% of rice needs of the population in Riau Province are still imported from outside of the region. The diversity of regional agro-ecosystems will have an impact on the ability of the community to access the supplied rice. This study aimed to assess the level of household accessibility to rice and the factors that influence it. The research approach used a survey. The area was determined purposively based on certain considerations. Siak District had the highest average per capita income, Kuantan Singingi District was a food center area, while Meranti Island District had a low average income. The research sample was 220 households that were randomly selected. The type of data used in this study were primary and secondary data. The level of ability of households to fulfill their food needs was assessed using Household Food Insecurity Access Scale (HFIAS) method. The data analysis performed were Chi Square (χ^2) and path analysis. The research results showed that there were households that had severe (24.45%) and moderate food insecurity (29.09%) of accessibility to rice. There were significant differences in the level of accessibility of households to rice in the three distrcts. Income and education factors of mothers had a positive and significant effect on the level of accessibilty, while the food pattern had a negative effect on the level of household accessibilty to rice.

Keywords: food accessibility, food policy, HFIAS, rice, Riau.

Effect of Interactive Nutrition Education on Knowledge, Attitude, and Practice of Primary School Children in Suburban Indonesia

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Summary

Healthy eating and active lifestyle play a significant role for good health and development of school children. This study measured the effect of interactive nutrition education on knowledge, attitude, and practice of primary school children in suburban Indonesia. A quasi-experimental design using questionnaire was conducted on August – November 2018 and has been involving 220 school children aged 9 – 10 years old from SDN Gunung Batu 1 and 2. Nutrition knowledge, attitude and practice (KAP) scores of the participants shows an improvement following the interactive nutrition education implementation. Increasing of practice scores in some participants may be due to multiple factors.

Keywords: attitude, interactive nutrition education, knowledge, practice.

Readiness of IPB University Students to Consume Fruit and Vegetable as Recommended by Health Ministry the Readiness of Consuming Fruit and Vegetable

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Abstract

This study was aimed to analyze the readiness of college students in consuming fruit and vegetable (F&V) as recommended by Indonesian Health Ministry (2013). The study was cross-sectional design, conducted in May-July 2018 in IPB University. There were 60 Community Nutrition (CN) students and 60 non-Community Nutrition (NCN) students, aged 20-23 years old, which chosen purposively to involved in the study. Data collected were subject's and family's characteristic, preference on F&V, F&V intake, knowledge, attitude, self-efficacy, and the readiness of F&V consumption using The Transtheoretical Model (TTM) questionnairre. Data were univariate and bivariate analysis. The results showed that CN students had better knowledge on benefit of consuming F&V and were more ($p<0.05$) in action-maintenance stage in consuming fruit (20%) and vegetable (41.7%) than NCN students (3.4% and 23.3% respectively), where mostly in precontemplation-contemplation and preparation stage. Daily intake of F&V for both CN and NCN students were far below the recommendation (48.9 g and 43.7 g; 25.9 g and 40.6 g respectively). Subject's readiness was positively related ($p<0.05$) to pocket money, knowledge, attitude, and self-efficacy, but negatively related ($p<0.05$) to family size. It is important to consider the readiness stage and related factors when designing nutrition education program to improve F&V intake in Indonesia.

Keywords: college student, fruit and vegetable intake, readiness, self-efficacy, transtheoretical model.

Mothers' and Children's Knowledge, Attitude, Practice on Indonesian Dietary Guideline and The Relationship with Children's Nutritional Status

Running Title:
Knowledge, Attitude, Practice on Indonesian Dietary Guideline

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Abstract

The aim of this study was to determine mothers' and children's knowledge, attitude, practice (KAP) on Indonesian Dietary Guideline (Balanced Nutrition Guideline) and the relationship with children's nutritional status. KAP were assessed using a set of developed-questionnaires according to the 10 messages of the guideline. A total of 210 school children from four public schools in Cianjur District with their mothers participated in this study from August to September 2018. A total of 60%-75% of school children had normal nutritional status, 4%-7% as thin, and 15%-33% as overweight/obese. The majority of mothers of school children in all school levels had good scores (>80) regarding knowledge, attitude, and practice on balanced nutrition. However, there were no significant differences between groups. Mother's knowledge on balanced nutrition was correlated with nutritional status in elementary school children (r=0.316, p=0.007). While, mother's practice on balanced nutrition was correlated with nutritional status in senior high school children (r=0.279, p=0.020). School children's knowledge, attitude and practice towards Indonesian Dietary Guideline were different among the school levels. Knowledge score on balanced nutrition was higher significantly in senior high school children (p=0.018), attitude score on balanced nutrition was higher significantly among elementary school children than junior and senior high school children (p=0.007). While the practice score on balanced nutrition was higher significantly in elementary school children than senior high school children (p=0.001). Practices on balanced nutrition guideline was correlated with nutritional status in senior high school children (r=0.283, p=0.018). Nutrition education must always be improved among mothers and school children so that Indonesian Dietary Guideline could be implemented in the daily life.

Keywords: dietary guideline, mother's knowledge, nutritional knowledge, nutritional status, school children.

Nutritional Status of Children Given Freshwater Fish Intervention

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Summary

The research objective was to improve the nutritional status of children under five years old. The research employed experimental method by feeding in the form of freshwater fish nuggets for 16 weeks to 180 children on the coast of Bandarharjo (PB) and in the mountains of Ngijo (PN). The results showed that there was a significant relationship ($p<0.05$) between the consumption of nuggets with an increase in nutritional status. The nutritional improvement by giving freshwater fish nuggets attractive to children can be applied to prevent stunting. This means that feeding nuggets can improve the nutritional status of children under five years old.

Keywords: fish consumption, intervention, children under five, nutritional status.

Economic Status, Stunting and Diet Quality are important Determinants for Anaemia in Indonesian Children Aged 6-35 Months Old: A SEANUTS Study

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Summary

More than half of Indonesian children in their golden age period of 6-35 months are anaemic. In order to solve this problem, detailed of the determining factors is needed to design a more effective approach. The study objective is to analyse determinants for anaemia among children aged 6-35 months. We conducted secondary data analysis from the SEANUTS cross sectional survey for Indonesia. Our study found that the children's haemoglobin levels were associated with economic status, stunting and diet quality. Hence, nutrition sensitive and nutrition specific intervention are both pivotal for prevention of anaemia in young children.

Keywords: children aged 6-35 months, diet quality, haemoglobin concentration, economic status.

Exclusive Breastfeeding May Protect the Occurrence of Wasted Among Under Five Children in Guntung Payung, Banjarbaru

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Summary

Wasting is a growth failure based on weight for height z-score, due to chronic lack of nutrition. The purpose of this study was to analyze the relationship of parity, family size, exclusive breastfeeding and complete basic immunization with the prevalance of wasted under five children in Guntung Payung Community Health Center Banjarbaru. A case control design was conducted on 60 respondents (30 controls and 30 wasting). These variabels were analyzed by Chi-square test. The results showed that mothers who do not provide exclusive breastfeeding ($p<0.036$) are 3.6 times more likely to have wasted children.

Keywords: exclusive breastfeeding, under-five children, wasting.

Personal Hygiene and Environment Sanitation of Pregnant Mothers Related to Birth Outcomes

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Abstract

This study aims to analyze the relationship between personal hygiene practices of pregnant mothers and household environmental sanitation with birth weight and height. This observational study was conducted at Ciampea, Bogor Regency, born in September 2019 - January 2020. Subjects were pregnant mothers selected through a purposive sampling of 46 people with inclusion criteria gestational age 28-36 weeks, age 18-35 years, and willing to be the subject. The exclusion criteria were multiple pregnancies or more, suffering from hypertension and diabetes mellitus, and the fetus had a congenital abnormality. The data were collected using questionnaires on the subject's characteristics, personal hygiene practices, and household environment. Meanwhile, birth weight and height were obtained from direct measurements using a digital baby scale. The data were analyzed using Fisher's exact test. The results showed that the age of most pregnant mothers (89.1%) were in a suitable category, which means subjects in good condition to pregnant. All of the subjects were in the third trimester, and 56.5% had adequate pregnancy spacing, and 95.7% were in the no-risk parity category. Almost all subjects (95.7%) were in the small family category. More than half subjects had <12 years of education. In terms of household income per month, 69.6% of subjects' families were classified as less than the regional minimum wages for 2018. The subject's hygiene practices were mostly acceptable (60.9%). Meanwhile, the subjects' household environmental sanitation for clean water facilities was already good (58.7%), while the subjects' sewage and waste disposal facilities were not good either with percentages (63.1%) and (89.1%). Pregnancy outcomes seen through the weight and length of the baby's birth were also mostly in the normal category, with percentages were (89.1%) and (71.1%). There was no association between ($p>0.05$) personal hygiene and household environment sanitation of subjects with birth weight and height.

Keywords: birth outcome, household environment sanitation, personal hygiene, pregnant mothers.

Relationship between Breakfast Type with Blood Glucose Level and Short-Term Memory of Elementary School Children in Bogor, Indonesia

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Summary

Breakfast consumption has positive effect on blood glucose level (BGL) and short-term memory (STM) of elementary school children (ESC). This research aimed to analyze the effect of different breakfast type on BGL and STM of ESC. Quasi-experimental study was conducted on 90 ESC. Subjects divided randomly into control group (C), fried rice with egg group (RE) and fried instant noodles with egg group (NE). BGL and STM of subjects were significantly higher after provision of breakfast. There was positive significant correlation between breakfast type and STM. Better nutrient profile of breakfast increased BGL and STM better than breakfast with lower nutrient profile.

Keywords: blood glucose level, nutrient profile of breakfast, breakfast type, school-aged children, short term memory.

Determinants for Stunting in 6 – 59 Months Old Children from Rural Agricultural Households in Cianjur, Indonesia

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Summary

Stunting disproportionately affecting children from rural agricultural households in Indonesia. This study aimed to identify determinants for height for age Z (HAZ) score among children under five years old in Cianjur district, an agriculture area with high stunting prevalence. The sample were 200 children aged 6 – 59 months old from farmers' household, selected randomly proportionate to size based on the community health post list. The HAZ score was strongly associated with age, access to clean water, vaccination and energy intake adequacy. Hence, Water Sanitation and Hygiene (WaSH), vaccination and energy intake are important elements for stunting prevention in rural Indonesia.

Keywords: clean water, energy adequacy, HAZ, stunting, vaccination.

Risk Factors of Stunting among 24-59 Months Old Children in the Work Area of Bakarangan Public Health Center Tapin District

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Summary

Stunting is a condition of failure to thrive in infants under five years old due to chronic malnutrition which either the z-score of length or height according to age is <-2 SD based on the standard of WHO. In 2018 the percentage of stunting in Tapin District is 32.7% and the highest is in the work area of Bakarangan's Public Health Center by 44.35%. The purpose of this study was to analyze the risk factors of stunting in the Work Area of Bakarangan's Public Health Center in Tapin District. This research was an observational analytic study using case control desain. The results showed there was relationship between the basic immunization status with the incidence of stunting, while there no relationship between maternal education, maternal occupation and exclusive breastfeeding with the incidence of stunting.

Keywords: basic immunization status, exclusive breastfeeding, maternal education, maternal occupation, stunting, tapin district.

Correlation between Dietary Behavior with Eating Disorder Risk of Adolescent Girls who participated in Modern Dance

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Abstract

This study aims to determine the correlation between dietary behavior and the risk of eating disorder. The design of this study was cross-sectional with 61 adolescent girls who participated in modern dance as a sample determined based on the total population. The data collection used Eating Attitude Test 26 (EAT-26) to measure the eating disorder variable and a questionnaire to measure dietary behavior. The data analysis using Chi square test with a certain level (CI) that is 95% or α = 0.05. The result of this study shows that 23% adolescent girl has the eating disorder risk and 63.9% do a diet. Chi square test shows there was a significant correlation (p=0.024) between dietary behavior with eating disorder risk. Adolescent girl mostly goes on an unhealthy diet by eating very small portions and often skip meals. Adolescent girls are advised to adopt healthy dietary behavior to prevent the risk of eating disorder.

Keywords: adolescent, dietary behavior, eating disorder, modern dance.

Online Food Delivery and Food Consumption Quality among Students of SMA Negeri 2 Yogyakarta Indonesia

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Summary

The existence of OFD (online food delivery) applications might alter one's dietary pattern, including adolescents. This research aimed to analyze the correlation between OFD with sample characteristics and food consumption quality among students of SMA Negeri 2 Yogyakarta. The design of this research was a cross-sectional study. The data was collected in November-December 2019 with 87 samples. There were significant correlations between OFD frequency with gender (C=-0.334, p=0.002) and age (r=-0.316,p=0.003), but there was no significant correlation between OFD frequency and food consumption quality. This research may depict how OFD correlated with dietary habit.

Keywords: adolescent, fast food, food delivery, obesity, online application.

Facilitators and Barriers to Sunnah Eating Practices among Overweight Middle- aged Muslim Women

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Summary

Sunnah eating practices (SEP) as guides by the prophet Muhammad has the element of healthy eating practices. This study assessed the facilitators and barriers towards SEP among overweight middle-aged Muslim women. A total of 22 participants were recruited through purposive sampling design and were interviewed face-to-face using an in-depth semi-structured interview guide. The major facilitators of SEP are health status, awareness, observe *Sunnah* practice and culture. Meanwhile, the major barriers are time constraints, outside foods, preferences and culture. Overall, the facilitators and barriers to SEP were much influenced by several factors including family, environment and education.

Keywords: barriers, facilitators, overweight, sunnah eating practices.

Dietary Quality in Indonesian Adults with and without Type 2 Diabetes Mellitus Using Healthy Eating Index

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Summary

Diet affects the incidence of Type 2 Diabetes Mellitus (T2DM), whilst dietary quality in Indonesia has not been assessed by the Healthy Eating Index (HEI). This study examines differences in dietary quality between T2DM and non-T2DM. There were 246 subjects T2DM and non-T2DM, which were selected from The Non-Communicable Disease Cohort Study. Dietary quality measured using HEI scores adjusted for Balanced Nutrition Guidelines (BNG). The result showed that dietary quality in T2DM and non-T2DM adults were not different. T2DM adults consumed higher foods source of polyunsaturated fatty acid (PUFA) and lower sugar-sweetened beverages (SSB) compared to non-T2DM.

Keywords: balanced nutrition guidelines, case-control, diabetes mellitus, healthy eating index.

Diet Quality among Postgraduate Students with Obese and Normal Nutritional Status in IPB University, Bogor, Indonesia

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Summary

Obesity is caused by imbalance consumption pattern and poor diet quality.The aim of this study was to evaluate diet quality among postgraduate students with obese and normal nutritional status in IPB University, Bogor, Indonesia. Cross sectional was used to carry out this study design. The subjects were selected with random sampling method. The instrument used to collect food consumption and food diversity data were 24-h diet recall and Individual Dietary Diversity Score (IDDS), respectively. Result showed subjects had medium diet quality (≥5 food groups). There is no difference in average adequacy level among subject with obese and normal status (p>0.05).

Keywords: diet quality, individual dietary diversity score, nutrient intake, nutritional status.

Indigenous Staple Foods Diversity from Palembang, South Sumatera, Indonesia and Their Potential to Support Food Security

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Summary

This study explores and analyzes Palembang's traditional staple foods that were easy to produce and had the potential to improve people's food security. Sixty types of traditional foods were still preserved and consumed by Palembang people who used local food sources. Nine types of food that mostly chosen by the people and are still consumed as staple food with a characteristic made of tapioca, rice flour and or fish. Food analysis showed that indigenous staple foods provide higher effect size on calorie (17.39±9.91 %db) and comparable content of carbohydrate, protein and fat, 6.30±9.20; 0.02±3.33, -0.88±4.53 %db, respectively, showed that.

Keywords: food security, local food, traditional food.

Physical Activity, Daily Steps, Sleep Duration and Sleep Quality in Overweight and Obese Women

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Summary

This study aims to determine the level of physical activity, daily steps, sleep duration, and sleep quality in overweight and obese women. The study applied a survey-based cross-sectional study on forty female students at IPB University in Indonesia. Data were analyzed using an independent sample t-test. The results showed that the daily steps of both are less active when compare with the recommended steps a day. Furthermore, the obtained level of overweight physical activity and obesity were categorized as low. The two groups had a lack of sleep when compared to the recommended sleep duration and quality per night. In addition, no significant difference was observed between the two groups with p> 0.05

Keywords: daily steps, sleep duration, sleep quality, overweight, physical activity level.

Acculturation-Related Factors of Dietary Pattern Changes among Indigenous Adolescents in Mt. Arayat, Philippines

Faktor terkait akulturasi dari perubahan makan di kalangan remaja pribumi di Mt. Arayat, Filipina

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Abstract

The process of acculturation contributes to major psychosocial, health, and dietary changes among immigrant populations. However, few studies have explored this process in the context of internally displaced indigenous populations. This study aimed to determine the levels of dietary acculturation and factors affecting acculturation-related changes in dietary patterns of 15 adolescents in an indigenous community in Mt. Arayat, Central Luzon, Philippines displaced after the eruption of Mt. Pinatubo in 1991. Mixed-methods sequential explanatory design (using modified scales) was employed to measure dietary acculturation; index analyses to evaluate dietary patterns; and focus group discussion to determine factors leading to dietary acculturation. Majority were found to be bicultural (93.33%) and the mean dietary pattern index score was 69.40 implying a need for dietary improvement. Moderate to high levels of dietary acculturation were observed on the traditional food block, while low to moderate levels were observed towards the dominant food block. Various psychosocial factors driving dietary choices cumulatively affect dietary patterns of adolescents experiencing acculturation in this study, including but not limited to: 1) the neighboring communities' ethnocultural composition facilitates acculturation primarily through language fluency; 2) prevalence of discrimination exerts an external pressure to adopt host culture for social acceptance; 3) economic need for integration to sustain day-to-day activities exists; 4) religious feasts and gatherings centered on foods previously unknown to them have been introduced; 5) food selection behavior shifts due to acquired experiences of food whether sensory or cognitive; and 6) their attitudes towards assimilation majorly characterizes the gradual internalization of host culture.

Keywords: acculturation, adolescents, dietary acculturation, dietary change, dietary pattern.

The Role of Exclusive Breastfeeding in Reducing Pneumonia Prevalence among Under Five Children

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Abstract

The objective of this study was to determine the role of exclusive breastfeeding toward pneumonia among children under five years in Bogor district. The design of this study was a case control study design on total 107 under five children with pneumonia (cases), and 107 under five children without pneumonia (controls) with multivariate logistic regression analysis. Smokers at home, indoor air pollution, level education of mother, immunization status, and nutrition status of those children were considered as covariates. Study showed that children who had not given exclusive breastfeeding had 6.699 times higher risk (95% CI: 3.204-14.007) to get pneumonia than children than children who had not given exclusive breastfeeding after controlled by covariates. Interventions through exclusive breastfeeding promotion, anti-cigarette program, use of stove with perfect burst, mother empowerment, immunization, improving nutrition status should be applied at each family for decreasing morbidity and mortality caused by pneumonia among under-five year children.

Keywords: children under five years, exclusive breast feeding, pneumonia.

Evaluation of the Implementation of Exclusive Breastfeeding Policy at Work in the Private Sector (Case Study of the Company in Semarang City - Central Java Province)

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Abstract

Giving exclusive breastfeeding in Indonesia, especially in the workplace is still not optimal. Data from Indonesia's Health Profile in 2016 shows that exclusive breastfeeding coverage for 6 months is 54%. Methods of this research used The Important Performance Analysis (IPA) analysis tool is used to determine the stakeholder satisfaction assessment of female worker respondents regarding the implementation of exclusive breastfeeding in the private sector. This research was conducted at selected private companies in the City and District of Semarang. Primary data were obtained from in-depth interviews with company management and filling in questionnaires by female workers. Based on the analysis of Important Performance Analysis (IPA), the assessment of workers' attitudes towards the performance of service corner in companies/private sectors is quite good (ordinary) with a value of 63 (out of a maximum value of 102). This research concludes that the workers want the location of the breastfeeding corner close to where they work and sufficient time to express milk. Women workers also want to prepare basic infrastructure such as pumping equipment, storage bottles and refrigerators to store milking milk.

Keywords: policy, exclusive breastfeeding, workplace, company, worker satisfaction.

Birth Weight and Length Are Associated with Stunting among Children Under-Five in Indonesia

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Abstract

The prevalence of stunting in children under five years old in Indonesia are fluctuating, but still high. The purpose of the study is to analyze the relationship of various factors with stunting. The research was a cross-sectional study conducted in Gowa district from January to July 2019. The study involved 90 children aged 12-59 months. The predictor factors for stunting were age, social-economic status, hygiene and sanitation, access and utilization of health care services, history of infectious diseases, birth weight, birth length, and mother's height. The children's nutrition status was measured using the WHO *AntroPlus*2010. The inferential statistics used were Chi-Square and Logistic regression. The result showed that Out of 90 children included in the analysis, 45 (50 %) were found to be stunted. In the multivariate analysis, The significant variables for the incidence of stunting were birth weight <2,500 grams [OR = 5.96, 95%CI: (0.93, 37.87)], birth length <48cm [OR = 5.06, 95%CI: (2.58, 87.97)], and the age of preschool children 12-36 months [OR = 080, 95%CI: (0.15, 0.89)]. Most importantly, children with birth weight less than <2,500 grams have a significantly higher risk (5.96 times) for stunting compared to children with birth length <2,500 grams. The conclusion of this study is birth weight, birth lengths, and the age are associated significantly with stunting, therefore nutrition during pregnancy is a key for the prevention of stunting.

Keywords: birth weight, birth length, social-economic, stunting.

Eating Behaviour and Physical Activity among Female Workers with Metabolic Syndrome: A Qualitative Study

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Summary

This study explored the eating behaviour and physical activity among female workers with metabolic syndrome conducted from June to July 2020 in the Government offices of East Kalimantan Province. Twelve female workers with metabolic syndrome participated in this study. The primary data was collected by using a qualitative study with an in-depth interviews, and the transcripts were analyzed using a thematic analysis. The five key themes were identified as their eating behavior and physical activity: low consumption of fruit and vegetables, irregular eating time, unhealthy food choices, eating outside the home, and physical inactivity.

Keywords: eating behaviour, physical activity, female workers, metabolic syndrome.

An Overview of the Adolescent's Nutrition Status in Samarinda, East Kalimantan

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Summary

The nutritional status of adolescents will determine the state of nutrition and health in adulthood. This cross sectional study aims to an overview of the adolescent's nutrition status in Samarinda. The study involved 1402 students from four junior hight schools (JHS). The result showed almost two third (65%) students had normal nutritional status and around a quarter (27%) were overweight-obese. Overnutrition were experienced by almost three times more compare ti undernutrition, and by more boys than girls. It is advisable to pay attention to diet and physical activity to avoid nutritional and health problems.

Keywords: adolescent, nutrition status, Samarinda.

Nutrition Education: Media Development and Nutrition Knowledge of Prospective Brides to Prevent Stunting on Newborn

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Summary

Prospective brides as the target of pre 1000 first day of life nutritional status has implications for the growth, development and long-term health of their offspring. Research aims to develop nutrition education materials as an effort to prevent stunting in newborn as well as knowing the acceptability and effectiveness of change in bride nutrition knowledge. Result shows the acceptance of the materials was high, 88.9% subject liked it very much and the rest like it. Paired t-test revealed significant increase in bride nutrition knowledge (p=0.000)

Keywords: bride, nutrition education, nutrition knowledge, stunting.

Maternal Parity and Height as Determinants of Stunting for Infants Age 0-6 Months

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Summary

This study aims to analyze the factors during pregnancy that cause stunting in children. The data used are secondary data from a cohort study of child development. The analysis was performed using normality test and logistic test. The analysis results show that maternal parity and height affect the incidence of stunting. While maternal age, upper arm circumference, body mass index before pregnancy, and maternal anemia status did not significantly influence stunting.

Keywords: Bogor cohort study, maternal height, parity, pregnancy, stunting infant 0-6 months.

Could Food Diary Intervention Improve School Children's Eating Habit?

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Summary

This study examines the efficacy of a tool to improve healthy dietary behaviour, called *My Eating Journal* (MEJ). Using a quasi-experimental design, the study enrolled 70 children and their mothers as participants into 2 groups, control or intervention. In the intervention group, children were asked to record their dietary intake data in MEJ for 30 days, and mothers reviewed their child's dietary diversity score report every 2 weeks. Results showed that knowledge score of healthy dietary behaviour increased for the intervention group versus controls; however, no improvement for eating practices was observed during the intervention.

Keywords: dietary diversity score, nutrition education, school children.

Sensitivity and Specificity of Food Consumption Score in Predicting Hypertension among Lacto-vegetarian and Non-vegetarian Women of Bali

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Summary

Decreasing hypertension prevalence is by modifying food habits, such as practicing a vegetarian diet. This study analyzes sensitivity (Se) and specificity (Sp) of food recall and food frequency questionnaire in predicting hypertension among lacto-vegetarian and non-vegetarian women. Food habits were assessed using a 24-hour food recall and food frequency questionnaire. The food recall method had 86.6%(Se) and 4%(Sp) among non-vegetarian women. The food frequency questionnaire had 83.3%(Se) and 21.4%(Sp) among lacto-vegetarian women. The results show food recall and food frequency questionnaire can be a predictor for hypertension.

Keywords: food frequency questionnaire, food recall, hypertension, sensitivity, specificity.

Relationship between Pre-pregnancy BMI with MUAC and Haemoglobin Level in Pregnancy

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Summary

Maternal nutritional status before pregnancy was a risk factor for maternal and fetal health. The purpose of this study was to analyze the relationship between pre-pregnancy BMI, mid-upper arm circumference (MUAC), and haemoglobin levels in pregnancy. This study used a cross-sectional study design involving 200 pregnant women. Data were collected using structured questionnaire and direct measurement. The result showed that 19% maternal were underweight before pregnancy. Anaemia was suffered by 51.5% and chronic energy deficiency by 19% of mother during pregnancy. Correlation test showed pre-pregnancy BMI was related to MUAC (r=0.746; p=0.000) and haemoglobin level (r=0.145; p=0.041) in pregnancy.

Keywords: anaemia, CED, nutritional status, pregnancy, underweight.

Determinants of Double Burden of Undernutrition among Women of Reproductive Age in Indonesia

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Summary

Nutrition problem among women of reproductive age (WRA) may deteriorate the pregnancy outcomes. This study analysed determinants of double burden of undernutrition (chronic energy deficiency and anaemia) among WRA (15-49 years old). Logistic regression was applied to analyse data from 14,467 WRA included in Indonesian Basic Health Research 2013. Prevalence of the undernutrition was 4.7%. Double burden of undernutrition was associated with history of diarrhoea (OR 3.8 95%CI1.709-8.553,p=0.001), younger age (OR 0.9 95%CI0.847-0.978,p=0.010), poor handwashing after defecation (OR 0.3 95%CI1.113-0.929,p=0.036), and low economic status (OR 0.3 95%CI0.109-0.853,p=0.024). Socioeconomic improvement and adequate hygiene and sanitation are needed to overcome the problem.

Keywords: childbearing age, hygiene and sanitation, influencing factor, poverty, women malnutrition.

Impact of School Lunch Project and Nutrition Education towards Nutritional Status, Knowledge, Attitude, and Practice on Nutrition and Health among Adolescents in Islamic Boarding School

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Summary

This study aimed to assess School Lunch Project (SLP) impact towards Nutritional status and the knowledge, attitude and practice on nutrition and health of adolescents. The pre-post quasi experimental study was applied among 102 subjects. Subjects received a healthy lunch for 156 days and ten sessions of nutrition education. The result showed a significant reduction in obesity prevalence ($p<0.05$), increased intake of energy, protein, and iron ($p<0.05$) also increased knowledge, practice, and attitude on nutrition and health ($p<0.05$). This study revealed that an integrated SLP is capable of significant improvements in nutrient intake, Nutritional status and nutrition education of adolescents.

Keywords: adolescents, healthy lunch, nutrition education, nutrient intake, obesity.

Study of Eating Behavior, Nutritional Intake, Hemoglobin Levels and Academic Performance among University Student

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Abstract

Several previous studies result shows that dietary habits are associated with poor academic performance. However, other studies have evaluated other factors that can affect academic performance. The objective of this study was to investigate the relationship between eating behavior and nutrient inkate, hemoglobin level, nutritional status, and academic performance. The crosssectional study was applied among 230 university students. Nutrient intake and eating habit was determined using 2x24 hour food recall questionnaire and Dutch Eating Behavior Questionnaire (DEBQ. Hemoglobin concentration from a capillary blood sample was determined by portable hemoglobin meter (HemoCue). Grade point average (GPA) was accepted as a measure of academic performance. The results showed 14.8% subject had anemia. Most subjects also had energy and nutrient intake deficit. The average score of the subject's eating behavior was higher in the external eating aspect (3.30 ± 0.56). The average subject has a grade point (IP) of 3.38 ± 0.38. There were a significat correlation between protein and iron intake with external eating behavior ($p < 0.1$), iron intake and anemia ($p < 0.05$), external eating with BMI ($p < 0.05$), restrained eating with BMI ($p < 0.05$ and emotional eating and hemoglobin levels ($p < 0.05$). Eating habits are directly related to nutritional intake, hemoglobin levels and nutritional status. Further analysis is needed to determine the relationship between eating habits and GPA.

Keywords: adolescent, emotional eating, external eating, restricted eating.

Knowledge, Attitudes, Vegetables and Fruit Consumption and Nutrition Status among Schoolchildren

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Summary

This study aims to determine knowledge, attitudes, vegetable and fruit consumption practices and the nutritional status of school children. A cross-sectional study design was conducted in school children. Data on knowledge, attitudes and practices of consumption of vegetables and fruit were collected by interview, nutritional status was determined using body mass index z-score (BAZ). The results showed knowledge, attitudes and consumption of vegetables and fruits and nutrient intaake are still in low category (59,8%, 42,7% and 59,8%), and 23.9% stunted and 12.0% wasted. It is necessary to conduct structured nutrition education in schools to increase daily vegetable and fruit intake.

Keyword: attitude, knowledge, school children, vegetables fruit intake.

Body Composition and Anaemia Status of Adolescent Girls in West Java, Indonesia

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Summary

There was a possible correlation between obesity and anaemia. This study analyses the correlation between body composition and Hb concentration among adolescent girls. We measured anthropometrics and Hb concentration of 2,184 school adolescent girls aged 15-19 years who participated in a Nutrition International (NI) funded project, i.e. a baseline survey of The 'Better Investment for Stunting Alleviation (BISA)' program in West Bandung and Sumedang-West Java. The results indicate that the prevalence anaemia was highest in adolescent girls with normal nutritional status and there was no correlation between BMI for age z-score (BAZ) and waist circumference with blood Hb.

Keywords: adolescent girls, anaemia, BAZ, Hb, waist circumference.

Education Level, Nutritional Status, Serum Ferritin and Blood Hemoglobin Level of Pregnant Women in Bogor District

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Abstract

This study aimed to determine associations of education level, nutrition intake and status, and serum ferritin level with blood hemoglobin (Hb) level of pregnant women in Ciampea, Bogor district. Thirty pregnant women in their second and third trimester were included in this cross-sectional study. Pre pregnancy body mass index (BMI) was determined by self-reported body weight and direct height measurement. Nutrition intake was calculated from 2 days of 24-h recall. Diet quality was estimated by energy and nutrient adequacy levels and individual dietary diversity scores (IDDS). Blood Hb and serum ferritin levels were analyzed by spectrophotometry and enzyme-linked immunosorbent assay methods, respectively. Depending on data distribution, Spearman or Pearson correlation was performed to analyze correlations between variables. The results showed that most women had low education level (66.6%), low adequacy levels of energy, carbohydrate, protein, fat, and iron (96.7%, 96.7%, 100.0%, 53.3%, and 100%, respectively); and had moderate IDDS score (76.7%). About one-third of women were overweight-obese prior to pregnancy. About one-fourth of women were anemic (Hb <11.0 g/dL), and 66.7% were iron deficient. No significant associations were found between blood Hb with energy and nutrient adequacy levels, IDDS score, and pre-pregnancy BMI (p> 0.05). Blood Hb was associated with education level (r=0.388; p=0.034). The results suggested that anemia among these pregnant women may be due to poor education levels. Improving education level as well as increasing iron intake is particularly important in reducing anemia problem among this group.

Keywords: anemia, education level, hemoglobin, nutrient adequacy, pregnant women.

Knowledge on Nutrition Label for Processed Food: Effect on Purchase Decision among Indonesian Consumers

Running title: Nutrition Label for Processed Food and Purchase Decision

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Abstract

If used appropriately, nutrition label can help consumers selecting food that meet the dietary recommendation to support their health. Understanding and proper use of nutrition label closely related to consumers' knowledge, which has not been reported thoroughly for Indonesian consumers. This study was conducted to observe the relationship between consumers' knowledge on nutrition label and their purchase behavior for processed food products among Indonesian consumers. A cross-sectional study was conducted in August-September 2018 in five different cities of three provinces (Jakarta, Bogor, Depok, Tangerang, Bekasi). Data were obtained from 400 adult consumers by self-administered questionnaires. The results showed that almost 70% of consumers in Indonesia checked food label; however, from that number, only 37.5% who paid attention on nutrition label of a food product prior to making purchase decision, most probably due to their knowledge on nutrition label that was still poor, as shown by mean score of 7.7 out of 14 questions (55%). In terms of food groups, milk and dairy products were deemed by the consumers to be important to be checked for their nutrition labels. When it comes to make purchase decision, almost all of the consumers (96.0%) decided to buy food products that had nutrition label as compared to those without any nutrition label. Furthermore, when compared to similar products also bearing nutrition label, consumers deemed the claims of low fat (28.7%) and low sugar (22.6%) as the sign of products that are healthier and have better nutrition profile. Knowledge on nutrition label (OR 1.139 95%CI 1.016-1.276, p=0.025) and purchase decision on product with nutrition label (OR 3.426 95%CI 1.220-9.623, p=0.019) were significantly associated with purchase decision for healthier processed food. This study has shown then importance of increasing consumers' knowledge on nutrition label in order to achieve bigger impact on food selection, nutrition, and health.

Keywords: consumers knowledge, food label, nutrition claim, nutrition label, purchase behavior.

Potential Losses of Inadequate Soybean Supply in Indonesia: Protein Adequacy, Revenue and Manpower

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Summary

Soybean is important protein source for Indonesian. A landscape analysis was conducted in 2016 to quantify potential losses due to unavailability of imported soybean. Without 70% of imported soybean for soybean businesses, including tempe and tofu producers, in Indonesia, adequacy level for protein will drop by 8.8% (Q5) up to 17.5% (Q1), IDR 1.3 trillions of tax revenue and IDR 41.4 trillions of net revenue from collapsed 5,068,468 soybean businesses' will also be lost which later will create 5,686,164 unemployments. This may also harm consumers' satisfaction and health. As implication, sufficient soybean supply fulfilled from local and import is essential.

Keywords: financial and non-financial loss, soybean consumption, soybean availability, tempe industries.

Diet Quality of Junior High School Children in Bogor, Indonesia

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Summary

One factor that trigger nutritional problems in adolescents is the low amount and quality of diet. Assessment of diet quality has an important role in evaluating a person's diet with guidelines. This study evaluated food intake and diet quality in adolescents at SMPN 2 Bogor. Food intake and diet quality were calculated using a 2 x 24-hours recall and analyzed using diet quality index for adolescents (DQI-A). The results showed that average amount of macronutrients intake was low as well as dietary diversity and dietary equilibrium. Hence, the DQI-A was classified as poor.

Keywords: Bogor-Indonesia, DQI-A, junior high school children.

Identification of Balanced Nutrition in Indonesia Elementary School Curriculum

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Summary

Poor nutrition and dietary habit are common among elementary school students in Indonesia. One way to improve the condition is through nutrition education at school. This study aimed to examine nutrition topics contained in the elementary school curriculum document by conducting content analysis using the Balance Nutrition Guideline as predetermined codes. The results of the study indicate that many competencies are dominated by physical activity and clean and healthy living habits, so it is necessary to consider completing curriculum competencies with other balanced nutrition messages in the subjects of school children.

Keywords: balanced nutrition, competency, curriculum, elementary school.

Food Habit, Nutrient Adequacy and Risk of Anemia in School Going Adolescent in Urban and Rural

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Abstract

Adolescent have a high risk of developing anemia due to increased need for iron to support rapid growth, low iron intake and absorption, and for the girls also risk of blood loss during menstruation for girls. Being anemic can cause higher increases vulnerability to infection, decreases cognitive function and development, and further lower reduces the productivity. This study aimed to identify and compare adolescents' food habits, nutritional aspects, and risk factors of anemia in urban and rural areas. There were four hundred and thirty five adolescents purposively selected from eight schools in South Jakarta (219 urban adolescents/UA) and Jasinga Bogor West Java (216 rural adolescents/RA). Data were collected using food frequency a set of questionnaires, anthropometric measurements and Hemocue. Both UA and RA ate meal 3 times a day. However, RA had better eating breakfast behavior than UA (55.1% vs 46.1%). Urban adolescent had higher frequency of meat consumption (14 vs 9 times per month), but lower fish consumption frequency (16 vs 24 times per month). Energy and nutrient intake was higher in UA than in RA; however, the intake only contributed to the requirement of two-third to three-quarter of energy, half to two-thirds of protein, one-fifth to two-fifths of calcium and around half of iron. Body fat percentage of UA tend to be higher. Anemia was suffered by about one third of UA and almost half of RA, and was also more common in females especially in rural area. Risk factors of anemia in urban were female (OR 4.67 95%CI 1.16-18.82, p=0.030) and lower body fat (OR 1.13 95%CI 1.01-1.26 p=0.035). In rural, more frequent fish consumption was associated with reduced risk of anemia (OR 0.88 95%CI 0.79-0.98 p=0.020). The study highlight the need to fulfill nutrients requirement for both male and female adolescents and to consider different approach for combating anemia in urban and rural areas.

Keywords: food habit, nutrient adequacy, urban-rural adolescent, risk factors of anemia.

Anemia, Stunting and Wasting in School-Age Children: A Crosssectional Study in Pidie District, Aceh Indonesia

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Summary

Malnutrition in school-age children can impair growth and academic achievement. This study aimed to analyze anemia and nutritional status in school children in Pidie District, Aceh. This cross-sectional study involved 607 children. Anemia is defined as having blood hemoglobin (Hb) levels <12 g/dL. Wasting and stunting were defined as having body mass index z-score (BAZ) and having height for age index z-score (HAZ) of less than -2 SD, resfectively. This research showed 41.7% children were stunted, 10.4% were wasted, and 81.6% had anemia. There were positive relationship between children's age, and the grade of students with stunting, the prevalence of stunting highest in ≥8 years old chidren and in grade 4 and 5 respectively. Malnutrition prevalence in study area was very high, therefore nutrition programs are needed to improve the condition.

Keywords: anemia, malnutrition, nutritional status, schoolchildren.

Improving School Readiness for WIFAS Program through School Readiness Training and Technical Assistance Intervention

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Abstract

This study examines the impact of enhancing school readiness for the program of school-based Weekly Iron Folic Acid Supplementation (WIFAS) implementation through training and technical assistance. A quasi-experimental design was used to analyze readiness levels after intervention in 6 intervention and 5 control high schools for 3 months. This study involved 115 teachers in baseline and 124 teachers in end line as respondents. Advisory assistance on educational materials and medicines was delivered to coordinating teachers and anti-anemia squad from 6 intervention high schools. A two days consecutive face to face training was delivered to 10 coordinating teachers and one full day anti-anemia squad training was delivered to 24 student girls' representatives for enhancing school's capacity building in implementing school based WIFAS program. By adopting and modifying the community readiness model, data were collected through interviews and using a questionnaire. A preliminary study shows that both high school groups were at the same vague awareness stage (third level), regarding female adolescent's anemia and adherence to the WIFAS program. After the intervention, the subject and control high schools had different levels of readiness. The subject high schools' readiness improved to the initiation stage (sixth level), while the control high schools remained at the vague awareness stage (third level). Training and technical assistance improved schools' readiness to implement the WIFAS program.

Keywords: adherence, anemia, female adolescent, iron-folic acid, school readiness.

Nutrition Education about Vegetable, Fruit and Fish for Elementary School Children

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Abstract

This study aims to determine the effect of balanced nutrition education interventions on vegetables, fruits and fish in increasing respondents' knowledge, attitudes and practices. The lecture and video methods are the media used to convey information about nutrition education interventions. The research method used was a pre-experimental design involving 160 grade five students in eight public elementary schools in Bogor Regency. There were two treatment groups, the first group was given intervention using lecture method, and the second group used video method. Nutrition education interventions were carried out three times with the topic of balanced nutrition, the benefits of consuming vegetables, fruit and fish, vitamins and minerals contained in vegetables, fruits and fish. Data collection was carried out before and after the intervention using a questionnaire about knowledge, attitudes and practices of balanced nutrition, consumption of vegetables, fruit and fish, food recall, and anthropometric measurements. Data analysis used Wilcoxon test and Mann Whitney test. The results showed that there was an effect of nutrition education interventions using lectures and videos ($p < 0.05$) on increasing good knowledge (58.5% and 38.5%), attitudes (78% and 71.8%), practices (30.5% and 26.9%) and vegetable consumption before (77.5 grams and 75.4 grams) after (137.69 grams and 137 grams) the intervention in the two intervention groups. Processing of nutritional status data using the WHO Anthroplus application with BMI/Age shows that there are still children with severe thinness and thinness, but overweight and obesity rates are higher. The results of differences in the average scores of students' knowledge, practice, and the average consumption of vegetables, fruit and fish indicate that the lecture method intervention is better than the video method. however, the two methods of nutrition education can increase school students' knowledge, attitudes, practices, and vegetable consumption. The suggestion from this research is that schools can carry out nutrition education regularly to form healthy eating habits in school children.

Keywords: attitude, knowledge, nutritional status, practice.

Nutrition Training Courses of Post-Disaster Recovery at Sembalun Bumbung Village, West Nusa Tenggara Province

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Summary

Nutrition disaster training courses help participants gain new knowledge and skills in maintaining nutrition status for under-five children. The study evaluates cadre's knowledge and skills after one-day training in Sembalun Bumbung Village. About 29 cadres participated in courses for each session lasts for 2 hours with the material presentation, discussion, and practice method. The data were collected using pretest and posttest questionnaires for knowledge and evaluation sheets for skill in developing a food menu during a disaster based on local food availability. The results indicate the courses can be useful to empower the participants in applying knowledge in the community.

Keywords: child, knowledge, nutrition, disasters, education.

The Halal Nutrition Model: A Technical Review

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Abstract

The protection of future population and the people's welfare, as mentioned in the "Maqasid Shariah" or the objectives of Islamic Law, is very important in view of the increasing negative behaviours existing in today's societies at large. This research on halal nutrition model focused on halal food consumed by the Prophet Muhammad s.a.w. and his eating practices which will impact any person's health. Some foods mentioned in the Quran and Hadith were studied to associate the relationship of halal food and health. The method used is reviewing journals, the Qur'an and Hadith and conduct cross referencing. It is concluded that the *Halal* Nutrition Model is in line with the Malaysian Healthy Plate whereby it is actually relevant and befitting the halal nutrition but the whole model has to be without the haram elements which are blood, pork, carrion and liquor to provide proper nutrition guidelines for quality and better consumption of *halal* food for the future population.

Keywords: carrion, halal nutrition, malaysian healthy plate, maqasid shariah, pork.

Determinants of Serum Vitamin D Level among Malay Workers during Non-Monsoon and Monsoon Season

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Abstract

Vitamin D is also known as the sunshine vitamin. Any factors that absorb or prevent ultraviolet B radiation will decrease cutaneous vitamin D synthesis. Very few studies have investigated the determinants of serum vitamin D levels using a set of variables that include simultaneously occupation, sun exposure, sun protection usage, dietary vitamin D intake, physical activity and anthropometry. This study aimed to identify factors modifying serum 25-hydroxyvitamin D (25(OH)D) levels among Malay workers during non-monsoon and monsoon seasons. A comparative cross-sectional study was conducted among outdoor (n = 119) and indoor workers (n = 119) in Kelantan, Malaysia. Data was collected twice from each respondent, firstly during non-monsoon and secondly during monsoon season. Anthropometric measurements (waist circumference, body fat and BMI), fasting blood test (serum 25(OH)D level) and questionnaire (socio-demographic, sunlight exposure, sun protection use, physical activity and dietary VD intake) were conducted. Data was analyzed using two separate multiple linear regression models. Serum 25(OH)D level was significantly lower among indoor workers regardless of sex and season ($p<0.001$). In model 1, serum 25(OH)D in non-monsoon season was significantly associated with female sex, sunlight exposure and sun protection scores. In model 2, serum 25(OH)D during monsoon season was directly predicted by sunlight exposure, and inversely by female sex, sun protection scores, indoor occupation and BMI. As the adjusted R^2 of both seasons were almost similar (>70%), and BMI as well as occupation were biologically and statistically meaningful to 25(OH)D, Model 2 was a better predictor of serum 25(OH)D level. This finding shows that 71.0% of 25(OH)D were explained by occupation, sex, sunlight exposure, sun protection and BMI. In conclusion, public health policies need to address these modifiable factors in order to improve vitamin D status in the general population.

Keywords: determinants, vitamin d, monsoon, Malay, occupation.

Association of Breastfeeding Self-Efficacy and Maternal Obesity in Kuala Selangor District, Malaysia: A Cross Sectional

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Summary

Maternal obesity were significantly associated with less intention to breastfeed, low breastfeeding self-efficacy and poor breastfeeding outcomes. This cross sectional study investigates the determinants of breastfeeding self-efficacy among overweight and obese pregnant mothers using self-administered validated questionnaires. There were 44.9% of overweight and obese from 200 recruited mothers. They had low breastfeeding self-efficacy and less intended to breastfeed as compared to normal-weight mothers. Past breastfeeding experience and exclusive breastfeeding intention are predictors of breastfeeding self-efficacy among overweight and obese pregnant mothers. Effective strategies should be conducted targeting this population with regards to low self-efficacy and intention to breastfeed.

Keywords: breastfeeding intention, breastfeeding self-efficacy, exclusive breastfeeding, maternal obesity.

Factors Associated with Stunting among 24-35-Month Old Kalinga Indigenous Children in Pinukpuk, Kalinga, Philippines: A Case-Control Study

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Abstract

The study identified the risk factors associated with stunting among 24-35 months indigenous children in Pinukpuk, Kalinga using case control design; 174 children (87 cases and 87 controls) were randomly selected and information were collected through interview and anthropometric measurements. Odds ratio and 95% confidence interval were used to measure association. Low birth weight, child drinking brewed or commercial coffee, no nutrient supplement intake since birth, and incomplete immunization were child risk factors of stunting. Exclusive breastfeeding from 0-6 months and weaning at >12 months have protective effect. Antenatal visits <4 times, father's height <5 feet, parent's education below secondary level were parental risk factors. Nuclear household and size <five members have protective effect against stunting. Having food restrictions among lactating mothers was cultural risk factors. Mothers' insufficient knowledge on exclusive breastfeeding, frequency of and proper way of breastfeeding, continuance of breastfeeding beyond 6 months, benefit of exclusive breastfeeding for six months to mothers and low self-confidence in preparing complementary food were associated with stunting. Mother's positive attitude on benefits of frequent feeding was found to have protective effect against stunting. Thus, these family factors could be used when designing an action plan to address the problem of stunting among the indigenous Kalinga children.

Keywords: stunting, case-control design, indigenous kalinga children.

Field Trial of the Updated Monitoring and Evaluation Protocol for Local Nutrition Plans and Program in the Philippines

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Abstract

The Local Government Nutrition Monitoring and Evaluation System (LGNMES) is the proposed new tool for monitoring and evaluation (M&E) of the local food and nutrition plan and programs. However, a field trial is needed to establish the reliability of the monitoring and evaluation team (MET) members in using the tool. This field trial of the LGNMES was conducted at the different levels of local government units (LGUs) to analyze the perceptions of the MET members about its protocol, to assess their reliability in using the tool, and to determine its difference from the existing M&E system, which is the Monitoring and Evaluation of Local Level Plan Implementation (MELLPI). The MET members were asked about their perception of the LGNMES protocol through a self-administered questionnaire. During the trial, each MET members individually scored the LGUs. A project team (PT) member was also asked to score these LGUs for comparison. Additionally, the data on the 2016 MELLPI scores of the LGUs were gathered to compare the two systems. Data on the perceptions of the MET members were subjected to median rank measure of central tendency and content analysis, while the scores of the LGUs were analyzed based on t-Test of paired samples, Pearson correlation coefficient, intraclass correlation coefficient (ICC) and technical error of measurement (TEM). The results revealed that the MET members had generally positive perspective on the LGNMES protocol but raised some concerns and issues needed to be resolved and considered prior to its nationwide implementation. Reliability of the MET members in using the tool was observed in the M&E of provincial and city levels but not of barangay levels. Furthermore, their scores were higher than scores of Project Team (PT) members but lower than the MELLPI scores. These findings reveal that steps should be taken to increase the reliability of the MET members in using the LGNMES tool.

Keywords: interrater reliability, monitoring and evaluation system, local government nutrition monitoring and evaluation system (LGNMES).

CLINICAL NUTRITION

Post Prandial Blood Glucose Control through the Consumption of Moringa Leaf Based Snacks

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Abstract

The number of Diabetes Mellitus (DM) cases at Mataram City Hospital increased from 75 cases in 2018 to 111 cases in 2019. Snacks are an important part of a diabetic's diet as it contributes to 10-15% of the total calories consumed in a day. Yet in practice, snacks for diabetic patients often have little to no variation. Moringa leaf, which possesses an anti-hyperglycemic effect, has yet been used extensively to produce snacks. This study aims to determine the effect of snacks made from Moringa leaves on blood glucose in DM patients. The study was carried out at the Mataram Health Polytechnic's Food Technology Laboratory and Mataram City Hospital, using a quasi-experimental design involving 30 subjects aged >30years, with average blood glucose of >200mg/dl, were consuming oral hypoglycemic medication and had been treated at the Mataram City Hospital. Subjects were type 2 DM patients divided into control and treatment groups with an equal amount at 15 subjects per group. In the treatment group, three types of Moringa oleifera foods were given made from fresh Moringa leaves for 15 days. The three types of snacks made were cupcake, pudding, and tea. Measurements of blood glucose levels were done prior and post-intervention. Statistical analyses performed include normality test, independent t-test and paired t-test. Results of the paired t-test, through the Wilcoxon Rank Test of the mean preprandial glucose level (Preprandial GL), with values of 231±98.4mg/dl (treatment group) and 310±117mg/dl (control group), showed no difference in the two groups of subjects with p=0.245. In contrast, the Post Prandial Glucose level (Postprandial GL) which were 267±94.3mg/dl (treatment group) and 330±127 mg/dl (control group) presented difference in the two subject groups at p=0.001. Snacks made from Moringa leaves were able to lower Postprandial GLUCOSE LEVEL and have implications in the subjects' glucose control.

Keywords: glucose level, moringa leaf, pre, postprandial glucose, snacks.

The Effect of Monday-Thursday Fasting on Body Weight and Body Fat Percentage among Overweight and Obese Men

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Summary

The purpose of this study was to analyze the effect of Monday-Thursday fasting on body weight and fat among overweight and obese men. Twenty subjects aged 19-29 years living in Bogor district were allocated into 2 groups, the intervention group followed a 12 weeks Monday-Thursday fasting while the control group did none. The paired T-test and Mann Whitney test were used to analyze the data. The results indicated after 12 weeks of Monday-Thursday fasting, the body weight, BMI, body fat percentage, and visceral fat of both group were not significantly different with the baseline data and from each other.

Keywords: body fat percentage, body weight, Monday-Thursday fasting, obese, overweight.

Ajwa Dates (*Phoenix dactylifera L.*) Juice for Reduction of Gastric Damage on Wistar Rat

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Abstract

The aim of this study was to analyze the effect of Ajwa dates juice on gastric damage in Wistar rat. This experimental laboratory study with posttest only control group design. Wistar rats were divided into five groups with five rats in each group (K, K+, P1, P2, P3). K group was not given Ajwa dates juice and aspirin, K+ was given aspirin, while P1, P2, P3 was given aspirin and Ajwa dates juice with concentration 20%, 40%, 60% respectively for fourteen days. Gastric damage seen by microscope magnification of 400x. The data was analyzed by Kruskal Wallis and Post Hoc Mann Whitney U test. The results showed that Ajwa dates juice had a significant effect on reducing gastric damage with p = 0.001. Concentration Ajwa dates juice 60% was the most effective reducing gastric damage on Wistar.

Keywords: aspirin, dates fruit, gastritis.

The Effect of Administering β-Glucan Extract from Oyster Mushroom on Tumor Necrosis Factor-α (TNF-α) and Fasting Plasma Glucose (FPG) Levels in High-Fat and Fructose Diet (HFFD)-induced Sprague Dawley Rats

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Abstract

Obesity, one of condition that triggers metabolic syndrome, is associated with chronic inflammation which leads to an increase in inflammatory cytokines production (TNF-α) and insulin resistance resulting in elevation of blood glucose levels. One of the ways of managing obesity is through local functional foods such as oyster mushrooms. Oyster mushroom contains β-glucan, which has a satiety effect as well as affecting fat and carbohydrate metabolism in the body. The purpose of this study is to determine the effect of β-glucan extract from oyster mushroom to the level of TNF-α and Fasting Plasma Glucose (FPG) in rats induced with High-Fat and Fructose Diet (HFFD). This study was conducted for 14 weeks, using male Sprague Dawley rats aged 8 weeks placed into 4 groups i.e. the normal diet group, HFFD group, HFFD+125 mg/kg of the β-glucan extract, and HFFD+375 mg/kg of the β-glucan extract. We measured FPG by glucometer, whereas TNF-α was analyzed by ELISA (Enzyme-Linked Immunosorbent Assay) method. The results of the FPG examination from the tail vein in the 8th week showed significant differences (p=0.004), but the FPG at the end of the intervention showed no differences and tend to increase in all groups. A significant difference was observed in the TNF- α levels with the administration of the β-glucan extract from oyster mushroom (p=0.013). β-glucan of oyster mushrooms enhances the activity of glucokinase and increases glucose utilization by peripheral tissues thereby lowering plasma glucose levels. Meanwhile, at the end of the study, the use of ketamine+xylazine (KX) anesthesia agents triggered acute hyperglycemia due to the modulation of glucoregulatory hormones through the stimulation of A2 adrenergic receptors. As for the inflammation, β-glucan presumed to downregulate macrophage expression and suppress the activation of AP-1 and NF-kB thereby lowering the TNF-α level. The results showed that FPG was heavily influenced by the administration of KX on the sacrifice process and the administration of β-glucan extracts from oyster mushrooms affect TNF-α level in HFFD-induced rats.

Keywords: β-glucan, inflammation, insulin resistance, oyster mushroom.

Supplementation of Lactic Acid Bacteria from Fermented Cassava Tuber during Tempeh Processing Improves the Profile of Glycemic Index and Gut Microbiota of Diabetic Rats

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Abstract

Introduction: Restoring the gut microbiota has gained attention to improve metabolic condition in diabetes mellitus. Tempeh is traditional fermented soy food from Indonesia that has anti-hyperglycemia effect. The anti-diabetic activity of tempeh can be elevated by addition of lactic acid bacteria during tempeh processing. Here, we evaluate the anti-diabetic activity of paraprobiotic tempeh in streptozotocin-nicotinamide diabetes mellitus rat model**.** Method**:** Paraprobiotic tempeh was made by soaking soybean in lactic acid bacteria from fermented cassava tuber overnight during tempeh processing. Diabetes was induced by injection of 65 mg/kg body weight of streptozotocin and 230 mg/kg body weight of nicotinamide. Rats were randomly allocated into 5 groups: control, negative control, tempeh diet replacing 15% (TP-15) and 30% (TP-30) of protein in the diet as well paraprobiotic tempeh in similar dose (TG-15 and TG-30). Fasting serum glucose and insulin were measured twice at day 5 and 30 after induction of diabetes. Rats were euthanized at day 30 and cecum was collected for gut microbiome profiling using ARISA. Result: Paraprobiotic tempeh has the highest lactic acid bacteria count (9.99±0.13 log CFU/g) compared with tempeh (7.74±0.11 log CFU/g). Serum glucose was significantly ($p<0.05$) decreased in all treatment groups with the highest reduction was observed in TG-30. Serum insulin was increased only in TG group with the highest insulin level was observed in TG-15 group (34.02±5.80 µIU/ml). Administration of both types of tempeh can increase the richness and diversity of gut microbiota. Conclusion: Addition of lactic acid bacteria during tempeh processing can increase the anti-diabetic properties of tempeh.

Keywords: diabetes mellitus, gut microbiota, lactic acid bacteria, tempeh, co-fermentation.

Glycemic Index Values of Market Available Common Rice Varieties in Bangladesh

Running title: Glycemic index of rice varieties in Bangladesh

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Abstract

Assessing glycemic index (GI) of six common rice varieties in the local markets of Bangladesh followed by their categorization was performed in this study to investigate manipulative varietal performance for the time being. After overnight fasting, each of ten selected healthy non-diabetic (male and female as 1:1) volunteers was fed reference food (50g glucose) and test foods (50g carbohydrate-containing different rice varieties), at 2 days intervals. Just after feeding, glucose levels (mmol/l) were measured at 0, 15, 30, 45, 60, 90 and 120 min. Incremental area under curve (IAUC) of reference food and test food (avoiding the area beneath the baseline of reference food) were calculated to measure GI values. Amylose content (%) of different test foods was measured from the standard curve obtained from the spectrophotometric analysis after alcoholic alkali gelatinization followed by acidification and iodine mixing. The result showed that the GI values were as 59.7±3.4, 50.5±2.6, 57.8±2.8, 51.3±2.3, 56.9±3.9 and 44.6±2.1 and the amylose content (%) were 23.6±0.6, 26.7±0.9, 21.3±0.7, 28.3±1.1, 22.2±2.3 and 29.8±1.5 for Nizershail, BRRI Dhan 29, Chinigura, Kalijira, Hybrid Hera Dhan 12 and Sworna, respectively. Moreover, the existing inverse relationship among the GI values and amylose content in this study was alike other researchers findings. Categorization of the test foods based on the observed GI values ranked Sworna, BRRI Dhan 29 and Kalijira as low GI rice varieties which could be beneficial for consumption by diabetics as well as healthy individuals.

Keywords: Bangladesh, glycemic index, market, rice varieties.

Effect of Brewing Temperature Variation on Moringa Oleifera Drinks Glycemic Control Capacity

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Summary

Moringa oleifera leaf contains Epigallocatechin gallate (EGCG), which is potential for controlling blood glucose. The research aims to analyze the effect of Moringa oleifera leaf's brewing temperature on healthy adults' glycemic control capacity. Ten subjects consumed anhydrous glucose diluted in 200 ml water, and 3-gram moringa leaves diluted in 200 ml water according to brewing temperatures (26°C, 70°C, and 90°C). The glycemic control capacity observed include the Oral Glucose Tolerance Test (OGTT) and Glucose Score (GS). This study showed that groups treated with moringa leaves brewed at 70°C and 90°C had lower than did the control and when brewed at 26°C.

Keywords: brewing temperature, glucose score, glycemic response, moringa oleifera.

The Effect of Different Methods of Rice Consumption on Eating Rate, Glycemic Response, and Glycemic Index of Healthy Adults

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Summary

Different chewing habits can affect postprandial blood glucose. This study assessed the effect of different methods of consumption Japonica rice (spoon, chopsticks, and fingers) on the eating rate (ER), glycemic response (GR), and the glycemic index (GI) of healthy adults. The ER was not significantly different between the different methods of consumption. The GR of consuming rice with chopsticks tend to be lower, but not significantly different compared to the spoon and fingers. There were no significant differences among the GI of rice eaten using chopsticks, spoon, and fingers, which categorized as high with score 79.3, 92.2, and 94.1, respectively.

Keywords: eating rate, glycemic index, glycemic response, method of consumption.

Iodine Urine Excretion and Utilization of Iodized Salt among the Household of Children Aged 6-23 Months in Aceh, Indonesia

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Abstract

Iodine deficiency in childhood affects a child's growth and development. This study aims to analyze iodine intake and urinary iodine excretion levels and risk factors using iodized salt in children aged 6-23 months household. This is a cross-sectional study that included 83 children aged 6-23 months. Iodine intake was collected using a 24-h food recall method, iodine urine excretion was analyzed by the ELISA method. The use of iodized salt was analyzed by the iodine-test of household salt samples, the characteristics of the sample, and maternal knowledge about iodine was collected by interview using a structured questionnaire. Data analysis included univariate and bivariate analysis using the logistic regression test at a 95% confidence level. The results showed that 74.7% of households did not use iodized salt and 45.8% of mothers had less knowledge. The average of iodine urine excretion was 272.9 ± 172.2 μg/L and 97.6% in the adequate category, and Iodine intake was 1.5±1.9 mg. There was a significant relationship between fathers education level p=0,046 and mothers knowledge p=0.002 (OR: 2.18, 95% CI: 1.03-75.6 and OR=-2.34, 95% CI; 0.02-0.42) with salt iodine utilization. The level of father's education and mother's knowledge were the risk factors for using iodized salt in the household. Efforts should be made to increase the use of iodized salt at the household level through education, promotion, and advocacy as well as monitoring of iodized salt circulation in the community.

Keywords: iodine intake, iodine urine excretion, iodine salt, knowledge.

Observational Study of Diet on the Burn Patients at Cipto Mangunkusumo Hospital Jakarta

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Summary

A certain administration of diet to support the healing process on the burn patients is necessary. This study aimed to observe the dietary intake of the burn patients at Cipto Mangunkusumo Hospital. Data collection methods were using food weighing, and data from integrated patient progress notes, and medical records. The result revealed that on average, the nutrient intake during hospitalization was inadequate (energy 71,92%, protein 66.93%, carbohydrate 58.58%, fat 83.55%). Further, the blood parameters level after 21 days admission was not significantly different from the baseline. Therefore, diet modification is needed to increase the nutrition intake of the patient.

Keywords: burn, diet, liquid food, nutrition, patient.

Effect of Chicken Essense on Lactation and Recovery from Fatigue: A Meta-Analysis

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Summary

Chicken essence (CE) known as a traditional liquid supplement popular in Asian Country that contains high protein and various valuable amino acids. Number of studies have been published showing the benefits of CE in mice and humans. This study aimed to synthesis the previous studies specific on the effect of CE on lactation and recovery from fatigue using Hedges'd effect size method. The results showed the content of iron, lactoferrin, Transforming Growth Factor-β2 (TGF-β2) and Epidermal Growth Factor (EGF) in colostrum has significant cumulative effect size. Similar result was derived on the effect of recovery from fatigue for total protein.

Keywords: carnosine, chicken essence, functional supplement, lactation, protein.

Haematological and Biochemical Serum Profiles of Experimental Rats Fed with GMO and Non-GMO Soybean

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Abstract

The imbalance between the amount of consumption and production causes the Indonesian government to import soybean from various countries. The United States, where 94% of its soybean products are transgenic soybean act as the main exporter. Currently, the consumption of GMO soybeans causes controversy regarding of its safety for consumers. This study aimed to compare the haematological and biochemical serum profiles of experimental rats fed with imported GMO and non-GMO soybean (imported and local Grobogan soybeans). This study was conducted by subchronic toxicity test for 90 days with 10 and 20% protein ration levels. GMO soybean had a very significant ($p < 0.01$) lower effect on platelet, urea, and uric acid values. However, the decrease was still within the normal reference value. In addition, there was no evidence of adverse effects observed in the blood composition, liver and kidney rats fed with GMO soybean**,** even though the protein content for the ration had been increased from 10 to 20%. To conclude, the haematological and biochemical profiles result of GMO soybean were equivalent to non-GMO soybean.

Keywords: biochemical profiles, GMO, haematological, soybean.

Effect of Ethanolic *Cajanus cajan* Leaves and *Zingiber officinale* Extracts on Spermatogenic Cells, Leydig Cells and Superoxide Dismutase in Testicular Tissues of Experimental Diabetic Rats

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Summary

Hyperglycaemia in diabetes mellitus causes oxidative stress. Reactive Oxygen Species (ROS) attacks all cell types, including spermatogenic and Leydig cells in testicular tissues. This study aimed to evaluate the effect of ethanolic *C. cajan* and *Z. officinale* extracts on the profile of spermatogenic and Leydig cells, Cu,Zn-SOD content in rat's testis, body weight and blood glucose level of alloxan-diabetic rats. This study concluded that the combination extracts of *C. cajan* (300mg/kgbw) and *Z. officinale* (60 mg/kgbw) increased the profile of spermatogenic and Leydig cells number, Cu,Zn-SOD antioxidant content in testis and body weight, reduced blood glucose level of alloxan-diabetic rats.

Keywords: cajanus cajan, diabetes mellitus, superoxide dismutase, testis, zingiber officinale.

In Vitro and In Vivo Hypoglycaemic Activity Test of Indonesian *Cajanus cajan* Leaves and *Zingiber officinale* Extracts

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Summary

Hypoglycaemic agent can manage diabetes mellitus. This study aimed to analyse phytochemical content, in vitro inhibitory activity to alpha-glucosidase, antioxidant activity, and in vivo hypoglycaemic activity of Indonesian *C. cajan* leaves and *Z. officinale* extracts in experimental hyperglycaemic rats. Both *C. cajan* leaves and *Z. officinale* extracts contained steroids, tannin, saponin, flavonoids, and exhibit antioxidant (IC_{50} value 287 and 232) and alpha-glucosidase inhibitory activities. The combination of *C. cajan* leaves 96% etanol extract (300 mg/kgbw) and *Z. officinale* extract (60 mg/kgbw) demonstrated the best hypoglycaemic effect, with area under the curve of blood glucose value significantly lower than acarbose (P≤0,01).

Keywords: alpha-glucosidase, antioxidant, cajanus cajan, hypoglycaemia, zingiber officinale.

Effects of Acute Supplementation of Caffeine on Physical Activity Performance

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Abstract

Alteration in physical activity performance following acute supplementation of caffeine has been studied in different populations but concurrent research in the Malaysian context has not been attempted before in the field research test. This study investigated the effects of caffeine in coffee beverage on physical activity performance. Twenty nine Malaysian athletes (aged: 22.2 ± 0.6 years; weight: 62.2 ± 13.1 kg; height: 164.7 ± 7.2cm; body mass index: 22.8 ± 4.3 $kg.m^{-2}$) participated in this randomized double blind placebo controlled cross-over study. Subjects consumed coffee beverage or placebo one hour before physical activity test. Shuttle run test, push up, sit up and maximum oxygen consumption (VO_{2max}) were measured between the caffeine and placebo trials. Body weight was measured at pre and post test to determine hydration status. The washout period was one week between the trials. Statistical analyses were performed using descriptive statistics and paired t test (SPSS version 26). Shuttle run test level and VO_{2max} were significant higher in caffeine trial compared to placebo trial ($p<0.05$). Sit up and push up were not significant different in both trials ($p>0.05$). There was not significant different body weight at pre and post-test in both trials ($p>0.05$). From the current study, it can be concluded that ingestion of caffeine improved the shuttle run test and VO_{2max} but did not impose any significant effects on other parameters such as body weight, sit up and push up.

Keywords: caffeine, VO_{2max}, shuttle run, push-up & sit-up.

A Nutrigenetic Approach to Examine the Relationship between Vitamin B12 Status and Metabolic Traits in Multiple Ethnic Groups

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Abstract

Low vitamin B12 concentrations have been shown to be risk factors for metabolic traits in numerous observational studies; however, the relationship has remained inconsistent. It is possible that certain genotypes might jointly contribute to obesity and vitamin B12 deficiency, and these may be modulated by dietary factors across different ethnic groups. Hence, the main aim of this scientific review was to summarize the effect of gene-nutrient interactions on vitamin B12 concentrations and cardio-metabolic disease risk factors using population-based studies from different ethnic groups. A total of four population-based studies were used to explore gene-diet interactions in Brazil (n=113), Sri Lanka (n=109), India (n=548) and Indonesia (n=118). Linear regression models were also used for interaction analyses between single nucleotide polymorphisms (SNPs) and dietary factors (continuous variables) on cardio-metabolic disease risk factors. Gene-diet interactions were observed in the Sri Lankan and Indonesian populations between the vitamin B12-related SNPs and protein energy intake (%) on markers of central obesity (waist circumference (P=0.002) and body fat percentage (P= 0.034), respectively). In the Brazilian adolescent population, the metabolic and vitamin B12 related SNPs showed a significant interaction with carbohydrate and protein intakes on oxidised low density lipoprotein cholesterol (P=0.005) and homocysteine concentrations (P = 0.007), respectively, which are well-known independent risk factors for cardiovascular disease. Additionally, in the Indonesian population, an interaction was observed between vitamin B12-related SNPs and dietary fibre intake (g) on glycated haemoglobin levels (P =0.042), a marker of long-term glycaemic status. Furthermore, for the first time, a novel association between two obesity-related SNPs and vitamin B12 concentrations (P = 0.018) was observed in the Indian population. In summary, these studies in multiple ethnic groups show that the relationship between B12 deficiency and metabolic outcomes may be influenced by dietary factors such as protein and fibre intake.

Keywords: SNP, GRS, obesity, metabolic traits, vitamin B12 pathway, nutrigenetics.

FOOD INNOVATION

Production of Wholemeal Bread from Banana Peel Flour: Improvement of Sensory Characteristics

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Summary

Banana peel flour is high in dietary fibre and has potential for inclusion in bakery products; however, it often results in low consumer acceptance due to poor sensory properties. This study aimed to produce whole meal bread incorporated with banana peel flour with improved sensory characteristics. Six treatments were employed: control, increased sugar, increased fat, increased water, prolonged fermentation time, and use of food conditioner. Two treatments yielding bread with the most optimum physical characteristics were increased water and prolonged fermentation time. Whole meal bread produced with prolonged fermentation time resulted in satisfactory sensory acceptance without detrimental effects on its fibre content.

Keywords: consumer acceptance, dough fermentation, high-fibre bread, non-wheat flour, organoleptic properties.

Instant Noodles from Pumpkin (Cucurbita *moschata* D.) and Anchovy Flour (*Stolephorus commersini*) as an Alternative Emergency Food

Mi Instan dari Tepung Labu Kuning (Cucurbita moschata D.) dan Tepung Teri (Stolephorus commersini) sebagai Alternatif Pangan Darurat

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Abstract

Instant noodles are one of the instant food products consumed by many people and can be applied in emergencies such as in areas affected by disasters. However, the protein content of instant noodles on the market is still low. The development of instant noodle products is necessary to fulfill emergency food requirements by utilizing pumpkin and anchovy flour. This study evaluated the sensory, physical, and chemical characteristics of instant noodles from wheat flour's substitution with pumpkin and anchovy flour as alternative emergency food. This research includes made pumpkin and anchovy flour, instant noodles formulation with the ratio of wheat and pumpkin flour 100:0, 90:10, 80:20, 70:30, 60:40, and anchovy flour of 0, 15, 20, 25, 30%. The analysis of the sensory (acceptance test), physical (water absorption, cooking loss, swelling volume, hardness, tensile strength), and chemical properties (moisture, ash, protein, lipid, carbohydrate content) of instant noodles have been performed. The data obtained were analyzed statistically. The results showed that the preferred instant noodles were instant noodles with the ratio of wheat and pumpkin flour of 80:20, anchovies flour to 30%. The higher the addition of anchovy flour, the higher water absorption, cooking loss, and swelling volume. On the contrary, the tensile strength and hardness of the noodles were lower. The addition of anchovies flour 30% increased the protein content of instant noodles up to 3.17 times compared to the control, with 24.32% db protein. That addition of anchovy flour following the Indonesian National Standard (SNI). Lipid and carbohydrate content fulfills emergency food standards. Based on sensory, physical, and chemical properties, the best treatment for instant noodle formulation with a ratio of wheat: pumpkin flour was 80:20, and the addition of anchovies by 30% can be used as an alternative to emergency food at 490.28 kcal.

Keywords: anchovy flour, emergency food, instant noodle, protein, pumpkin flour.

Increased Fibre Content in Frozen Par-Baked Chapatti with Incorporation of Okara Flour

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Summary

With its high fibre content, okara has potentials to be used in products, e.g. par-baked frozen bakery. This study aimed to develop frozen par-baked chapatti (Indian flat bread) through substitution of atta flour with okara flour. Six substitution treatments were applied. Samples were analysed for their physical characteristics, sensory acceptance and nutrient content. Up to 15 % substitution gave no significant effects on samples' texture and color. Furthermore, it almost tripled the sample's fibre content without any detrimental effects on its sensory acceptance. Frozen storage up to eight weeks did not significantly affect samples' characteristics, thus making this product feasible.

Keywords: flat bread, frozen bakery, soybean residue, unleavened bread, whole meal bread.

Antioxidant Activity and Total Phenolic of Encapsulated Stingless Bee Propolis by Spray Drying Method

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Abstract

Propolis development of food products is still very limited because of its strong taste and aroma. Encapsulation of propolis with spray drying technique can be an alternative to avoid undesirable sensory characteristics. The aim of this study was to obtain an encapsulated *Trigona itama* stingless bee propolis powder by spray drying method. Propolis was extracted with water solvent by ultrasound method, then dried by spray drying technique using mixture of maltodextrin and Arabic gum as coating agent. Propolis encapsulation was consisted of three formulas with the ratio of propolis and coating agents as follows, F1 (1:1), F2 (1:2), and F3 (1:3). The morphology profile was analyzed by Scanning Electron Microscope (SEM) images. Analysis of total flavonoids and total phenols using $AlCl_3$ and Follin-Ciocalteu methods. Antioxidant activity was analyzed using DPPH method. The results demonstrated that all formulas were well encapsulated which was indicated by uniform spherical shape in SEM images analysis. The F3 has the highest yield (65.22%) and the lowest moisture content (3.89%), while F1 has the highest solubility (98.96%) compared to other formula. The F1 also has the highest antioxidant activity (1692.131 mg/L), total flavonoid (0.80 mg/g QE), total phenol (3.81 mg/g GAE), and encapsulation efficiency (81.69%). Analysis of variance showed that the type of formulas significantly affected all physical and chemical characteristics (p=0.000), except moisture content (p=0.165) and solubility (p=0.127). Therefore, the F1 was the best formula for obtaining encapsulated propolis due to its high antioxidant activity, total falvonoid and phenol.

Keywords: encapsulation, propolis, spray drying, stingless bee, trigona itama.

The Microbiological Safety of Instant Pumpkin and Tempeh Cream Soup Formulated as Geriatric Food

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Summary

Inadequate nutritional intake and decreasing cognitive function causes the elderly need special food. Instant pumpkin and tempeh cream soup was formulated as geriatric food to meet nutritional requirements. However, it is essential to consider the safety aspects. This study aimed to analyze the microbiological safety of formulas, including Total Plate Count (TPC), *E. coli,* and *Salmonella* analysis. The TPC value in the formula without tempeh was significantly higher, although all formulations were in normal limit. Furthermore, *E. coli* and *Salmonella's* values were negative in both samples. Therefore, the product can be categorized safe from microbiological contaminant.

Keywords: food safety, geriatric food, microbiological contamination, pumpkin, tempeh.

Proximate Composition and Sensory Characteristics of Milkfish (*Chanos chanos*) Snack Bar

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Summary

The objective of this study was to evaluate the use of milkfish (*Chanos chanos*) as one of the snack bar ingredients. Three formulations were used with different composition of fish flour and oat flakes (10%:20%, 20%:10%, and 0%:30%). The result indicated that snack bar with 20% fish flour had significantly higher protein among other samples. Analysis of variance (ANOVA) showed that there was significant difference of sample added with fish flour and 0% fish flour sample in most sensory attributes. In conclusion, milkfish is a potential candidate ingredient to replace other imported plant based protein resources.

Keywords: fish flour, snack bar, protein, ready-to-eat food, local ingredient.

Development of Instant Pumpkin (*Cucurbita moschata*) Soup as Potential Source of β-Carotene for Elderly

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Summary

Instant soup is an ideal meal for elderly due to its fast preparation and easy to digest. Pumpkin and carrot are highly nutritious food, especially rich in β-carotene. This study aimed to develop soup with different ratio between pumpkin and carrot (1:2, 1:1 and 2:1) and different type of processing (fresh and instant). Nutrients content (energy, protein, fat, carbohydrate, β-carotene) were determined using proximate analysis and HPLC. ANOVA with Duncan's test and independent samples t-test were applied. Based on hedonic test, the selected formula was instantly processed soup with 2:1 pumpkin to carrot ratio and contained 3380 mcg β-carotene.

Keywords: β-carotene, cucurbita moschata, elderly, soup, pumpkin.

Total Phenolic Content (TPC) and Total Flavonoid Content (TFC) of Protein Hydrolysate Extracted from Oil Palm Leaves (OPL)

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Abstract

Protein hydrolysis using proteolytic enzymes is the most popular method to produce biologically active proteins. The plant-derived protein hydrolysate exhibited bioactive functions due to its high amount of phenolic compounds. This study focused on the effect of different hydrolysis conditions on the molecular weight of protein, total phenolic content (TPC) and total flavonoid content (TFC) of protein hydrolysate extracted from oil palm leaves (OPL), a widely available raw material. Protein hydrolysis was conducted using different types of enzyme (Alcalase, Pepsin and Flavourzyme) with concentration ranges of 0-10% v/w and time of hydrolysis from 2 h to 6 h. The protein hydrolysate molecular weight was determined using SDS-PAGE gel electrophoresis. TPC was determined using Folin-Ciocalteu's reagent while TFC with aluminium chloride solution. Three-way ANOVA (α = 0.05) was used to determine the statistical interactions between three hydrolysis factors on TPC and TFC of protein hydrolysate. The molecular weight of protein hydrolysate extracted using Alcalase and Flavourzyme was 30 kDa while Pepsin was in the range of 3 kDa to 30 kDa. Different types of enzyme with time of hydrolysis and different types of enzyme with enzyme concentrations had significant interactions, but time of hydrolysis did not have significant interaction with enzyme concentration. The highest TPC was exhibited by Flavourzyme condition extracted protein hydrolysate (2 h, 0%) with 88.3 mg GAE/ 1 g protein hydrolysate while the highest TFC was shown by Pepsin-extracted (6 h, 10%) with 59.1 mg RE/ 1 g protein hydrolysate. The TPC and TFC of OPL protein hydrolysate were comparable to organic black tea and green tea extracts with 68.2-91.8 and 88.7-108.2 mg of GAE/ 1 g extract, respectively. This study showed that OPL protein hydrolysates contained high amount of TPC and TFC, which could serve as a natural source of antioxidant to be applied in food products.

Keywords: oil palm biomass, alcalase, pepsin, flavourzyme, TPC and TFC.

Powdered Drink from Mixture of Coconut Water and Flesh: A Potential Beverage Formulation with Increased Fibre

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Summary

Coconut is considered highly perishable thus it needs to be processed to prolong its shelf life. This study aimed to produce powdered coconut drink from coconut flesh and water. A total of 8 samples were observed in triplicate. Coconut water from younger fruits was sweeter and the flesh was thinner. Meanwhile, older coconuts, especially from the tall variety, had higher dietary fibre (8.70 – 48.40 %) and lower available carbohydrate (20.08 – 73.45 %). This study has shown that powdered coconut drink from mature coconuts of tall variety could be considered for consumers needing higher fibre intake.

Keywords: cocos nucifera, freeze drying, hybrid variety, maturity age, tall variety.

The Use of Germinated Soybean as Tempe Ingredient during Extended Fermentation Time: Its Hypoglycaemic Component

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Summary

Germination of soybean and extended fermentation time are methods to improve the tempe quality. This study was aimed to evaluate the hypoglycaemic components in tempe produced from combination of soybean germination and extended fermentation time. The treatments used in this study were the combination of soybean types (germinated and non-germinated) and fermentation time (48, 72, and 96 hours). The result of this combination increased total insulinotropic free amino acid and isoflavone content, but no significant increase was observed in antioxidant activity. This study suggested that the combined treatments increased the hypoglycaemic components, particularly insulinotropic free amino acids and isoflavones content.

Keywords: antidiabetic, extended fermentation, germinated soybean, hypoglycaemic, tempe.

Pempek Made from Javanese Bird Grasshopper (*Valanga nigricornis*) as an Innovative Food Product: Nutritional and Acceptability Assessments

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Summary

This research aimed to develop a nutritious food made from Javanese bird grasshopper (*Valanga nigricornis*), one of indigenous edible insects from Indonesia. A product development has been performed, followed by nutritional and acceptability assessments. The nutritional analysis provides information that this product meets the requirement as source of protein, high of fibre, source of zinc, and high of monounsaturated fatty acids (1). Acceptance rate of this grasshopper *pempek* is 7 (like moderately) with consumer acceptability is 93%.

Keywords: acceptability, edible insect, indigenous source, product development.

Indigenous Black Soybean (*Glycine soja* L. *merrit*) Tempeh Nugget as Plant Based Protein Source

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Summary

Black soybean (*Glycine soja* L. *merrit*) is an Indonesian indigenous-legume with high protein, fiber, and antioxidants, but contains numerous anti-nutrients. To improve the nutritional value, this study aimed to develop it into a nugget tempeh as an alternative of plant based protein source. Product development followed by nutritional evaluation has been performed. The selected black soybean tempeh nugget product was a formula with ratio of black soybean tempeh and filler 60:40 which enable to meet the requirement of source of protein (14.3 g/100 g). This transformation from bean into nugget tempeh enable to improve the protein digestibility till 46.8%

Keywords: black soybean, indigenous legumes, tempeh nugget, product development, protein source.

Development of Roll Cake from Rice-bran Flour Mixed with Taro Flour and Breadfruit Flour Purposed for Elderly

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Summary

Elderly is one group that susceptible to suffer malnutrition due to insufficient and poor diet. Commonly, they had various health problems-related their age including constipation. The aim of this study was to create roll cake from a mixture of rice-bran, taro, and breadfruit flour as fiber-rich food products. This study was an experimental study using completely randomized design. The highest dietary fiber and lowest fat content were found in roll cake which produced from a combination of rice-bran and breadfruit flour. The roll cake could be an alternative nutritious product for supplying sufficient energy and preventing constipation in elderly.

Keywords: breadfruit, elderly, fiber, rice-bran flour, roll cake.

Amino Acids, Calcium, and Zinc Contents of Spray-dried Balinese Cow Bone Marrow Encapsulated with Maltodextrin, Arabic Gum, and Milk Powder

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Summary

Balinese cow bone marrow is by-products from cattle farms that contain abundant nutrients required during growth period. Due to high lipid level, bone marrow is less soluble and it contains low amino acid level. Encapsulation with appropriate coatings can protect the nutrients, enhance the solubility, and complete their nutrients level. This study aimed to analyze amino acids, calcium, and zinc content of Balinese cow bone marrow encapsulated by spray drying technique. It was coated with milk powder, Arabic gum, and maltodextrin. Balinese cow bone marrow encapsulated only with milk powder had the highest amino acids, calcium, and zinc content.

Keywords: Balinese cow, bone marrow, coating materials, microencapsulation, spray dryer.

Macro and Micronutrient Content of Raw Propolis Collected from Different Regions in Indonesia

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Abstract

Propolis is a substance generated from various plants and accumulated in specific sites by bees. However, geographical origin greatly affects the chemical composition of propolis causing the possibility of difference in its biological activities. The bioactive compounds of three well-known Indonesian propolis including from Bintan, Lampung, and South Sulawesi have been analyzed, but their nutrients content was unknown. Therefore, the aim of this study was to determine the nutrients content of raw propolis from three regions in Indonesia. Carbohydrates, protein, fat, ash, moisture, and fibers were determined using AOAC method, alongside vitamin B complex through High-Performance Liquid Chromatography (HPLC) and several minerals with the use of inductively coupled plasma-optical emission spectrometry (ICP-OES). Additionally, the differences of nutrients content were analyzed using ANOVA followed by Duncan's post-hoc test. The result showed that Indonesian raw propolis mostly contains crude fat (38.67-61.64%), dietary fibre (45.02-58.72%), and carbohydrate (25.80-64.91%). Propolis from South Sulawesi had significantly higher protein and crude fat content than other samples ($p<0.05$). The significant amount of sodium, potassium, copper, zinc, iron, and calcium content was found in propolis from Bintan ($p<0.05$). Pottasium, phosphor, mangan, magnesium, pyridoxine and folic acid were significantly found in propolis from Lampung ($p<0.05$). Our study shows Indonesian raw propolis could be utilized in developing functional foods, however the contents may differ between the regions.

Keywords: Indonesian propolis, macronutrient, mineral, raw propolis, vitamin.

Nutritional Profile of Lamtoro Seed (*Leucaena leucocephala*) and Its Fermented Product (*Mlanding Tempeh*)

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Summary

On global issue, the search efforts for alternative vegetable proteins is in harmony with the efforts of global protein sustainability. Lamtoro is a legume has a complete nutrient content. The aim of the study is to investigate the content of nutrient in lamtoro seeds and acceptability mlanding tempeh from various cooking method. This study used an explorative experimental design. The nutritional content of lamtoro seeds changes after the fermentation process is carried out. Fried mlanding tempeh has the highest score in taste and color. The fermented product of lamtoro seeds can be an alternative source of vegetable protein.

Keywords: fermentation, legumes, leucaena leucocephala, mlanding tempeh.

Amino Acids and Minerals Content of Black Oncom Processed with Fermentation Modifications

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Abstract

Nutrient content especially amino acids and minerals of black oncom (fermented peanut meal) processed in natural fermentation are varied and mostly are low. The aim of this study was to analyze the effect of starter and storage condition of black oncom production processing on the amino acid and mineral compositions. This research was conducted from June to December 2019 at IPB University; completely randomized design with treatments of the use of *Rhizopus oligosporus* starter and storage conditions was applied on this study. Amino acid assay were measured by UPLC (ultra performance liquid chromatography) and minerals were measured by AAS (Atomic Absorption spectrophotometer). Both amino acids and minerals were determined by AOAC method. Black oncom produced from a controlled fermentation process had significantly higher amino acids ($p<0.05$) compared to black oncom made traditionally by traditional producer. Both controlled fermentation and traditional fermentation, the highest amino acids was glutamic acid (6.31±0.88 g/100 g; 3.85±0.62 g/100 g) and the lowest amino acids was methionine (0.003 g/100 g; 0.17±0.09 g/100 g) respectively in dry basis. Likewise, the mineral content of calcium (189.54±32.69 mg/100 g) and zinc (9.49±0.77 mg/100 g) was also significantly higher than traditional fermentation. In conclusion, the controlled production process of black oncom can produce higher amino acids and some minerals content than natural fermentation process.

Keywords: amino acids, black oncom, controlled fermentation, minerals, traditional fermentation.

Formulation of Liquid Breakfast from Campolay Fruit with Mung Bean and White Rice Flour as Supplementary Food for School Children

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Summary

Liquid breakfast can be used as an alternative to the breakfast menu. The aim of this research was to develop formula from campolay fruit with mung bean and white rice. Campolay (Pouteria campechiana) has a potential carbohydrate sources, moreover comination of rice and mung bean could complete amino acids. The selected formula (25% mung bean and white rice flour addition) had significantly higher acceptance level than others treatments. The selected formula contained moisture, ash, protein, fat, carbohydrate, 73.2%, 0.9%, 4.3%, 2.2% , 19.5% respectively. The limiting amino acid in this product was sulphur amino acid. This product was higher in protein, fat, and carbohydrate content than existing products.

Keywords: amino acids, campolay fruit, liquid breakfast, mung bean, white rice flour.

Cookies and Beverage from Tempeh: Potential Nutritive Supplementary Products for Pregnant Women

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Summary

Tempeh-based products for pregnant women are not yet available. This research aimed to identify characteristics of tempeh cookies and beverage and its contribution to nutrient need of pregnant women. Nutrient, sensory, mineral content analysis was conducted. Both products contained 18 essential and non-essential amino acids, omega 3, 6 and 9 fatty acids. Nutrient contribution per serving size of tempeh cookies and beverage were 16.6 and 3.2% of energy, 7.8 and 2.9% of protein, 18.0 and 9.2% of calcium, 8.8 and 5% of iron, 15.2 and 2.1% of zinc, 22.0 and 14.6% of folic acid, respectively. Both products were accepted and safe to be consumed.

Keywords: pregnancy, tempeh beverage, tempeh cookies.

Development of Enteral Feeding Formulas for Stroke Patient Using Lactose-Free-Milk and Mung Bean as Non-Dairy as Protein Source

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Abstract

Stroke patients often experiencing dysphagia, difficulty in speaking and, gastro intestinal problem which lead to malnutrition. This can be prevented by providing adequate enteral feeding. Milk is often the main ingredients in enteral feeding formula, but some patients might dislike milk due to personal preference. Therefore, the study aimed to develop two enteral feeding formulas; the milk-based lactose-free enteral food (LEF) and a mung bean based enteral food (BEF) to replace the milk protein. This study used a completed randomized design. The factors tested were lactose-free-milk of 10, 14, 18% (L1, L2, L3 respectively); and the mung beans formulas of 7, 8, 9, 10% (B0 or control, B1, B2, B3 respectively). The parameters measured on enteral feeding were osmolality value (Osmometer), thickness, and nutritional content. The results showed that the osmolality value of the LEF was lower than the commercial product, while the osmolality value of the BEF was higher than control ($p<0.05$). Based on the estimated calorie density, the best formula of LEF was the 18% whereas the best formula of BEF was 10%. We tested the qualitative thickness of the formula using gravity method, and all formulas were found to have good level of thickness due to the absence of obstruction while passing through the NGT (size of NGT = 14 Fr). The nutritional content per serving size of 250 ml L3 formula was 6.3 g protein, 10.4 g fat, 35.5 g carbohydrates, 93.23 mg Na, and 189.55 mg K. The nutritional content per serving size of 200 ml BEF 10% formula was 6.49 g protein, 2.67 g fat, 13.58 g carbohydrates, 73.15 mg Na, and 257.96 mg K. Therefore, LEF 18% and BEF 10% can be developed further as alternative enteral food diet formulas for stroke patient.

Keywords: enteral food, lactose-free, mung bean, osmolality, stroke.

Cookies from Tempeh Semangit as Indigenous High Protein Supplemental food for Pregnant Women

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Summary

This study aimed to develop high protein tempeh cookies with ferrous fumarate addition as supplemental food for pregnant women. Cookies are more practical than other forms of rations, also semangit tempeh has higher amino acid content than common tempeh. Complete randomized design was used with four tempeh fermentation variations, namely Control(HK), 48 hours fermented soybean(H0), 120 hours fermented soybean(H3), and 144 hours fermented soybean(H4). Amino acid analysis of H4 showed that the three highest amino acids were L- glutamic acid, L-Aspartic acid and L-Arginine. Therefore, this cookie has potential as supplemental food for pregnancy women to prevent newborn stunting.

Keywords: cookies, essential amino acid, fermentation, stunting and tempeh.

Antioxidant Activity in Ready-to-Drink Beverage Made from Snake Fruit (*Salacca edulis Reinw*) Enriched with Butterfly Pea (*Clitoria ternatea)* and Roselle (*Hibiscus sabdariffa*) Flower Extracts

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Summary

This research aimed to develop the antioxidant-rich ready-to-drink beverage made from snake fruit and to observe the effect of addition of butterfly pea and roselle flower extracts to antioxidant activity in snake fruit juice. Snake fruit juice was prepared by boiling sliced snake fruit in water for 15 minutes. Dried flowers were added to snake fruit extract at 90^{o}C then cooled and filtered. The addition of butterfly pea flowers did not increase pH, the amount of vitamin C, phenolic compounds and antioxidant activity of snake fruit juice, while roselle flowers decreased pH and increased vitamin C, phenolic compounds and antioxidant activity.

Keywords: antioxidant activity, clitoria ternatea, healthy drink, hibiscus sabdarifa, snake fruit.

Development of Fiber Snack Bar for Obese Teenagers Using Lesser Yam *(Dioscorea esculenta)*

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Summary

To improve food security, it is preferable to produce snacks using local comestibles such as lesser yam (*Dioscorea esculenta*) that contain high dietary fibre. This study aimed to analyse the effects of lesser-yam-based snack bar to the acceptability, chemical and physical characteristics. This study used a completely randomised design (CRD) with three treatments, which was conducted on 30 semi-trained panellists from April to May 2019. The result was F1 (50 g of lesser yam flour) that contains total dietary fibre 12.8% chosen as the selected formula. Therefore, lesser yam snack bars are categorised as a fibre-source food.

Keywords: fibre, lesser yam, obesity, snack, snack bar.

Improving the Quality of Chicken Sausage by Using Germinated Soybean Tempe Protein Isolate

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Summary

Tempe protein isolate (TPI) is a potential local commodity due to the high quality of protein as the main compound. TPI can be utilized in various food products for quality improvement, such as sausage, which often has problems with emulsification. This study was aimed to compare the application of TPI with commercial soy protein isolate (SPI) in chicken sausage based on functional, physicochemical, and sensory characteristics. TPI was obtained from germinated and non-germinated soybean tempe. Result showed sausage with germinated soybean tempe protein isolate had the highest of most quality as compared to non-germinated soybean tempe protein isolate and SPI.

Keywords: functional properties, germinated soybean, protein isolate, sausage, tempe.

Reduced-Sugar 'Serikaya' as Potential Sweet Spread for Diabetic Patients

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Summary

Sucrose, a simple sugar contributing to quick increase of blood sugar, is not favoured by diabetic patients. Stevia, a sugar substitute, can be used to produce products with lower sugar and it may reduce the amount of available carbohydrate for digestion. 'Serikaya', a popular sweet and delicious spread from coconut, traditionally contains high sugar. Thus, this study aimed to develop 'serikaya' with lower sugar through substitution of sucrose with stevia as a natural non-caloric sweetener. Five combinations of sugar and stevia were studied and analysed for physical characteristics, sensory acceptability and calculated for nutrient composition.

Keywords: calorie content, glycemic index, stevia rebaudiana, sweetener, table sugar.

Meta-Analysis on Edible Larva as a Future Protein Source for Human: Do they have Comparable Nutritional Quality with Red Meat?

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Summary

This preliminary meta-analysis was intended to evaluate the nutritional quality of edible insects only from larva stage and compared with red meat. A total of related 18 studies were integrated. For such comparison, effect size using Hedges'd method was employed. Results revealed that, in comparison to red-meat, the edible insect larva had significantly higher protein content with comparable amino acid score, higher ratio of PUFA/SFA, and higher contents of valuable minerals (Ca, Mg, K, Fe, Zn). Further development of food process technology to cover the original form of the larva would be very important to increase the community acceptance.

Keywords: edible insects, future protein, insect stage, protein quality, sustainable nutrition.

Potentials of Ozone Pre-treatment in Prolonging the Freshness of Oyster Mushrooms (*Pleurotus florida*)

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Summary

The objective of this effort was to determine the effect of ozone and packaging condition on post-harvest quality of mushrooms. Browning is primarily influenced by the presence of Polyphenol Oxidase enzyme. Ozone being a strong antimicrobial and a reducing agent can helps in retarding the action of the enzyme and thereby promoting the quality of mushrooms. Mushrooms were treated with gaseous ozone at 10 and 15 ppm for 5 and 10 minutes and packed in HDPE packaging material with ambient and vacuum-packed conditions. Ozone pre-treatment combined with packaging condition was found to be effective in extending the keeping quality of mushrooms.

Keywords: browning, oyster mushroom, ozone, polyphenol oxidase enzyme, shelf life extension.

Effect of Blanching and Drying on Retention of Ascorbic Acid in Indian Gooseberry (*Phyllanthus emblica*) Candy

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Summary

This study was undertaken to optimise the vitamin C content during processing of Indian gooseberry (candy).Indian gooseberries were blanched (70-90ºC for 5-15 min and pressurised condition), syruped and then dried (cabinet and microwave) for candy processing. Blanching temperature of 80ºC for a time period of 20 min was found to be sufficient for the preparation of Indian gooseberry candy and retention of 315.5±19.53 mg/100g vitamin C was observed after blanching. The hardness and the chewiness of the blanched product were found to be 4.28±0.14N and 2.20±0.16N for 80ºC 20 min samples. Cabinet drying of the blanched sample (80ºC 20 min) at 70^{O}C gave the maximum retention on the final candy (217.75±7.4 mg/100g), followed by microwave drying (178±11.21 mg/100g).

Keywords: ascorbic acid, blanching, drying, heat treatment and Indian gooseberry.

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