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**05 - THE SATURATED FATTY ACIDS PALMITIC ACID AND STEARIC ACID DO NOT DIFFERENTLY AFFECT CHOLESTEROL EFFLUX CAPACITY: RESULTS OF A HUMAN DIETARY INTERVENTION TRIAL** May 18 2022 Background: It is well-known that the saturated fatty acid stearic acid (C18:0) lowers LDL-cholesterol and HDL-cholesterol concentrations as compared with palmitic acid (C16:0). As related to CHD risk, the decrease in LDL-cholesterol is beneficial, while the decrease in HDL-cholesterol is controversial. Recent evidence suggests that not increased HDL-cholesterol concentrations, but the ability of the HDL particles to perform cholesterol efflux from macrophages (cholesterol efflux capacity; CEC) may protect against CHD risk. Therefore, our primary objective was to examine the effects of palmitic acid versus stearic acid on CEC of the HDL fraction during the fasted state. Secondary objectives were effects on fasting lipids, (apo)lipoproteins, and cholesteryl ester transfer protein (CETP). Study design and population: This study was a double-blind, randomized, crossover study with two four-week isocaloric intervention periods, during which subjects received products enriched with palmitic acid or stearic acid. Difference between palmitic acid and stearic acid intakes were 6% of total energy. Thirty-four healthy men and women (61.5±15.7 years, BMI: 25.4±12.5 kg/m<sup>2</sup>) completed the study. Results: CEC was not significantly different between the diets. Compared with palmitic acid, stearic acid lowered concentrations of total-cholesterol, LDL-cholesterol, HDL-cholesterol, and apolipoprotein-A1. No significant differences were observed in apolipoprotein-B100 and triacylglycerol concentrations. CETP mass was higher on the stearic acid diet. Conclusion: Although concentrations of HDL-cholesterol and apolipoprotein-A1 were lower on the stearic acid diet, CEC was not significantly different. CETP may be involved in the observed decrease in HDL-cholesterol. Stearic acid lowered total- and LDL-cholesterol, without lowering the total number of apoB100-containing lipoproteins. This study was funded by Unilever R&D Vlaardingen (before divesting its spreads business and since July 2, 2018 operating under the name Upfieldu2122).

**Lipid Mediators** Aug 21 2022 The Handbook of Immunopharmacology: Lipid Mediators covers a comprehensive overview of lipid mediators, from synthesis through to inhibition. The book discusses the metabolism of arachidonic acid; the measurement of fatty acids and their metabolites; and the biological properties of cyclooxygenase products. The text also describes other essential fatty acids, their metabolites and cell-cell interactions; the inhibitors of fatty acid-derived mediators; as well as the biosynthesis and catabolism of platelet-activating factor. The cellular sources of platelet-activating factor and related lipids; the biological properties of platelet-activating factor; and the effects of platelet-activating factor receptor antagonists are also considered. Immunopharmacologists, immunologists, and pharmacologists will find the book invaluable.

**An Analysis of Fatty Acid Metabolism's Role in the Development of Acute Functional Tolerance to Ethanol in *Caenorhabditis Elegans*** Apr 05 2021 An individual's naïve level of response (LR) to ethanol is predictive of their lifetime likelihood to abuse alcohol. LR is heavily genetically influenced, suggesting that the genes responsible for LR may also be central to the development of abuse disorders. Our laboratory uses the model organism *C. elegans* to investigate the genetic influences on responses to acute ethanol exposure. We recently found that changes in TAG levels can alter LR. From this result we investigated the role of long-chain polyunsaturated fatty acids (LC-PUFAs) as well enzymes involved in lipid modifications of proteins. We found that LC-PUFAs are necessary for acute functional tolerance and that supplementation of eicosapentaenoic acid is able to rescue AFT. We also identified mutations in several palmitoyltransferases, a thioesterase, and elongases that alter AFT. These novel results highlight the importance of fatty acids in the response to ethanol and suggest exciting new potential therapeutic targets.

**Adrenergic Regulation of Regional Fat Metabolism** Feb 21 2020 Introduction: An increased gluteofemoral adipose tissue (AT) mass is associated with a protective cardiovascular and metabolic risk profile, and effective fatty acid retention in femoral AT has been proposed as a possible mechanism. Catecholamines are important regulators of AT lipolysis and blood flow (ATBF). The aim of the thesis was to investigate regional differences in the adrenergic regulation of fatty acid release and ATBF between abdominal and femoral AT in vivo. Furthermore, in vivo regional fatty acid trafficking was studied in a physiological setting over 24 h. Methods: Regional fatty acid trafficking, along with the measurement of ATBF, was studied with the arterio-venous difference technique and stable isotope tracers in healthy volunteers. Adrenergic agonists (isoprenaline, adrenaline) were infused either locally by microinfusion, or systemically. Local microinfusion of adrenoceptor antagonists (propranolol, phentolamine) was used to characterize specific adrenoceptor subtype effects. The trafficking of dietary fatty acids was studied over a 24 h period involving three meals containing stable isotope-labelled fatty acids along with intravenous infusions of another labelled fatty acid. Results: Femoral ATBF and lipolysis was less responsive to adrenergic stimulation with adrenaline compared to abdominal AT. This was due to increased femoral  $\alpha$ -adrenoceptor responsiveness. When studied over 24 h, femoral AT showed a lower lipolysis rate compared to abdominal AT, while dietary fatty acids were extracted more avidly by abdominal AT. Uptake of non-dietary fatty acids (derived from very-low-density lipoproteins or unbound non-esterified fatty acids) was comparable between abdominal and femoral AT. Conclusion: There are fundamental differences in response to adrenergic stimuli between abdominal and gluteofemoral tissues and the ability of femoral AT to trap non-dietary fatty acids may provide protection of other tissues from ectopic fatty acid deposition. iv.

**Polyunsaturated Fatty Acids in Butter and Their Influence on the Oxidation of Butter** May 06 2021

**Nistir 7953 Interlaboratory Analytical Comparison Study of Total Fatty Acid Concentrations in Human Serum** Jul 20 2022 The National Institute of Standards and Technology (NIST), in conjunction with the Centers for Disease Control and Prevention (CDC) and NIH's Office of Dietary Supplements (ODS), initiated an interlaboratory analytical comparison study of total fatty acid concentrations in human serum in May 2012. The first sample was candidate Standard Reference Material (SRM) 2378. SRM 2378 consists of three levels of fatty acids in serum collected from: (1) donors who have not taken fish or flaxseed oil supplements for one month prior to collection; (2) donors who have taken flaxseed oil supplements for a minimum of one month prior to collection; and (3) donors who have taken fish oil supplements for a minimum of one month prior to collection. In addition, participants were requested to run SRM 1950 Metabolites in Human Plasma as a control sample. This is a performance-based program so participating laboratories were requested to use the analytical procedures that they typically use in their laboratories for these analyses and report data for those fatty acids that they typically quantify. The results from the first exercise are reported along with a summary of the analytical methods used.

**Alternative Sources of Omega 3 polyunsaturated Fatty Acids** Oct 19 2019 The majority of United States citizens are not receiving enough omega 3 unsaturated fatty acids in their everyday diet. Although fish are a significant source of omega 3 unsaturated fatty acids, they are a declining resource, making the discovery of alternative sources of omega 3 unsaturated fatty acids necessary. Different types of essential fatty acids, fish derived omega 3 supplements, and algae derived omega 3 supplements were tested using a free fatty acid quantitation kit. The different types of essential fatty acids and supplements were tested with human plasma, which allowed for the quantitation of the fatty acids absorption by human plasma. The results showed that algae derived omega 3 supplements were absorbed almost two times more than the fish derived omega 3 supplements. This analysis supports algae being considered a significant source of omega 3 polyunsaturated fatty acids that can be used as a dietary supplement in everyday diet.

**New Insights Into Structure and Function of the Different Types of Fatty Acid-binding Protein** Dec 13 2021

**Isolation and Determination of the Free Fatty Acids of Milk Fats** Nov 24 2022 The free fatty acids of milk fat are believed to be involved in imparting flavor properties to milk and other dairy products. In the past the free fatty acids have largely been related to quality deterioration and hence the methods for measurement have been devised to determine the changes in the free fatty acid content and to relate these data with quality. No method has been reported to determine the quantities of individual free fatty acids. The purpose of this investigation was to evaluate procedures and adapt methods for isolation and measurement of the free fatty acids of milk fat and then to evaluate adapted methods by quantitative measurement of the individual acids in fresh cream fat samples and in butter made therefrom. The ion exchange method of Hornstein et al. (50) was modified to isolate and esterify the free fatty acids from milk fat. The free fatty acids were adsorbed on Amberlite IRA-400 resin, the resin was made fat free and the bound acids were simultaneously esterified and eluted with anhydrous methanol-HCl. The methyl esters were extracted from the reaction mixture with ethyl chloride (b.p. 12.3°C.). The ethyl chloride was evaporated and the esters weighed. The methyl esters were then separated by gas-liquid chromatography using the thermal conductivity detector. The recovery of each saturated even numbered fatty acid from 4:0 to 18:0 was checked. The percent recoveries obtained were: 4:0, 71.4; 6:0, 86.5; 8:0, 66.6; 10:0, 75.1; 12:0, 94.3; 14:0, 100.2; 16:0, 99.5 and 18:0, 92.5. The ion exchange resin was checked for its fat hydrolysing capacity, for retention of fatty acids when used in successive analyses and for leachings of brown polymers during each analysis. The resin did not show detectable hydrolysis of triglycerides nor did it retain or exchange fatty acids from previous use. It was necessary to pretreat the resin with stearic acid and anhydrous methanol-HCl to avoid interference of a leached polymer with quantitative results. An average of 5.0 mg of residue leached from the resin during every analysis, but this did not interfere with the quantitative determination of free fatty acids. Twenty samples of milk fat; ten from pasteurized sweet cream, nine from cultured butter and one from sweet cream butter were analyzed for free fatty acids. The results obtained were compared with the esterified fatty acid content of milk fat. The percent composition of free fatty acids was similar to that of the esterified fatty acids in milk fat. Also the manufacturing process of butter had little or no effect upon the free fatty acid composition of the fat. The values obtained for volatile fatty acids, especially 4:0, were not consistent. One reason for this probably was that evaporation of the ethyl chloride from the solution of the methyl esters was carried out at room temperature and the evaporation rate was not controlled. It is believed that the results would be more consistent if the evaporation of ethyl chloride were carried out under controlled and standardized conditions and if internal standards are employed for quantitative references rather than weighing the ester mixture. Samples of autoxidized milk fat, sweet cream fat and rancid cream fat were analyzed for further evaluation of the method.

**An Idea Spot for a University Farm** Nov 19 2019

**Lipid and Fatty Acids Deposited in *Cynomolgus* Monkeys as a Result of Long-term Feeding of Lard-corn Oil and Partially Hydrogenated Herring Oil as Major Dietary Fats** Jul 28 2020

**Interlaboratory Analytical Comparison Study of Fatty Acid Concentrations in Human Serum** Mar 16 2022

**Impact of Alternative, Non-fish Oil Dietary Lipid Sources and Subsequent 'finishing' on Growth and Tissue Long-chain Polyunsaturated Fatty Acid Retention in *Cobia*, *Rachycentron Canadum*** Aug 09 2021 *Cobia* (*Rachycentron canadum*) aquaculture is poised for expansion, due in part to rapid growth rate, tolerance of culture conditions, and high market value of this species. Similar to other carnivorous marine fishes, the high monetary cost and long-range unsustainability of reliance on fish oil as the principle lipid source for *cobia* feeds necessitates evaluation of alternative lipid sources to spare or replace fish oil. Unfortunately, alternative lipid-based feeds may affect production performance, and typically yield fillets with reduced levels of long-chain polyunsaturated fatty acids (LC-PUFAs) such as docosahexaenoic acid (DHA, 22:6n-3). Recent research has indicated that diets rich in saturated fatty acids (SFAs) and monounsaturated fatty acids (MUFAs), coupled with the application of so-called "finishing feeds" (feeds containing elevated levels of fish oil relative to grow-out feeds) at the end of the production cycle, may limit or attenuate these effects of fish oil sparing. Accordingly, I conducted two trials to evaluate the usefulness of alternative lipids

and finishing in cobia culture. In the first trial, I assessed growth performance and tissue fatty acid composition of juvenile cobia fed diets (~11% lipid, ~48% protein) containing fish oil (control), or 50/50 blends of fish oil and alternative lipids (beef tallow, pork lard, partially and fully hydrogenated soy oils, and traditional soy oil) supplemented with an algal meal (to meet the 22:6n-3 requirement of cobia) for 8 weeks. Although minor differences were observed in feed intake, growth performance was otherwise equivalent among the dietary groups. Tissue fatty acid composition varied significantly among treatments, however, with alternative lipids containing higher levels of saturated (SFAs) and monounsaturated fatty acids (MUFAs) yielding tissue profiles that were most similar to those associated with the fish oil-based control feed. Although beef tallow and hydrogenated soybean oil were largely equivalent in terms of growth performance and fatty acid profile change, beef tallow was selected for further evaluation because of its low cost. In the second trial, beef tallow replaced fish oil in feeds at one of four substitution levels: 0% (100% fish oil), 33%, 67%, or 100% tallow (with algal 22:6n-3 meal included in all feeds as before). Juvenile cobia were raised on these feeds for 8 weeks, then switched to the 100% fish oil-based control feed for an 8-week finishing period. During finishing, subsamples of fish were collected every 2 weeks to quantify changes in tissue fatty acid profile over time as a result of finishing. In the second trial, the overall similarity of tissue fatty profiles to those in the 100% fish oil control treatment increased over the course of finishing, mostly as a result of declines in SFAs and MUFAs. These results suggest that SFA and MUFA-rich lipids, such as fully hydrogenated soy oil and beef tallow, are effective and strategically valuable as partial substitutes for fish oil in cobia feeds, and that finishing is at least partially effective in restoring cobia tissue fatty acid composition to a state approximating that of cobia fed only fish oil as dietary lipid.

**Mediterranean Diets** Jun 07 2021 Contrary to popular belief, there is no such thing as one Mediterranean diet: This geographic region includes several nations with varied cultures, traditions, incomes and dietary habits, resulting in a wide variation of dietary patterns. The present volume focuses on the latest research data from basic science and clinical intervention studies that indicate that a balanced ratio of omega-6 and omega-3 fatty acids and a high antioxidant intake from fruits and vegetables, along with olive oil, contribute to a lower rate of heart disease and increased longevity. These benefits are especially pronounced in the population of Crete, indicating that this diet is particularly healthy. Moreover, descriptions of the diets of Greece, Italy, Spain and the Maghreb are given for the first time, pointing to their differences as well as to their common dietary patterns; these are followed by chapters on the nutritional and metabolic contributions of antioxidants, wine, olive oil and fatty acids. Results from the Lyon Heart Study lead to the conclusion that plasma and cell membrane phospholipid omega-6 and omega-3 fatty acid ratios are among the main biological effects of the experimental modified diet of Crete tested in this trial. Results also show that a pattern based on a modified diet of Crete decreases the death rate of both coronary heart disease and cancer. Physicians, nutritionists, cardiologists, cancer specialists, food scientists, agriculturists, dietitians as well as the informed public will find this volume of particular interest.

**Recent Results of Research on Arteriosclerosis** Oct 31 2020 Initiated in 1975, the Eberbach/Wiesloch Study is a prospective preventive study modeled after the Cardiovascular Comprehensive Community Central Programme of the WHO, with the aim of lowering the incidence of cardiac infarctions in a population representative of that of the Federal Republic of Germany. Part of the study is devoted to a description of smoking habits, and in particular, of the effect of cigarette smoking on plasma lipid and lipoprotein levels. Important components of this investigation were the inclusion of plasma levels of cotinine (a stable metabolite of nicotine and the only precise parameter of cigarette consumption), as well as the correlation of cotinine with other plasma parameters. Not only are these studies unique in the Federal Republic of Germany, but they also provide significant insight into the development of arteriosclerosis in connection with the established risk factors of smoking and hyperlipidemia. The data collected point to a considerable influence of smoking behavior on plasma lipid protein parameters.

**Individual Fatty Acid Intakes** Dec 01 2020

**Dietary Omega-3 Polyunsaturated Fatty Acids and Cancer** Mar 24 2020 Dietary Omega-3 Polyunsaturated Fatty Acids and Cancer provides all the latest information on the possible benefits of omega-3 polyunsaturated fatty acids (PUFAs) against a wide series of cancers. Several influential scientists in this field have contributed to make this book unique amongst the others published so far in this field. The chapters give detailed information about the results obtained in this field through experimental studies conducted on both animals and cultured cells, as well as through human intervention trials and epidemiological observational studies. This book represents an important tool for researchers working in nutrition and oncology, since it collects all the knowledge about omega-3 PUFAs and cancer, even the most recent, in a single publication. For the first time controversies among the different studies are also covered with great detail in this book. The book enables physicians to clearly understand on a scientific basis if their oncologic patients or patients at risk of cancer could actually benefit from a diet enriched in omega-3 PUFAs or from a dietary supplementation with these fatty acids. The book represents also a good resource for ordinary individuals as well as cancer patients to learn more about omega-3 PUFAs and understand how these dietary components may affect cancer growth.

**Nutrient Analysis of Retail Cuts of Pork** Apr 17 2022

**Effects of Dietary Polyunsaturated Fatty Acids on Colorectal Cancer and the Development of the Total Western Diet-2** Jun 26 2020 The Western diet is commonly consumed by industrialized societies and characterized by an increased consumption of vegetable oils rich in omega-6 (n-6) fatty acids. This results in a higher ratio of omega-6 to omega-3 (n-3) fatty acids in the diet. Omega-6 polyunsaturated fatty acids (PUFA) are believed to induce a pro-inflammatory response in the body. Therefore, this change in PUFA concentration and/or ratio of n-6:n-3 in the Western diet may contribute to colorectal cancer (CRC) risk. Five identical diets, varying only in PUFA concentration and n-6:n-3 ratio, were fed to mice dosed with a carcinogen and an inflammatory agent (AOM+DSS). The diets included: 1.) AIN-93G, control diet, containing 7% (kcal) dietary PUFA, 7:1 n-6:n-3 ratio, 2.) 2.5% dietary PUFA 1:1 n-6:n-3 ratio, 3.) 2.5% PUFA 20:1 n-6:n-3, 4.) 10% PUFA 1:1 n-6:n-3, and 5.) 10% PUFA 20:1 n-6:n-3. PUFA ratio had a significant effect on tumor size. Diets having an n-6:n-3 ratio of 1:1 resulted in significantly larger tumors than diets with an n-6:n-3 ratio of 20:1. Mice fed either the AIN-93G or 2.5% 1:1 diet had the highest number of tumors compared to the other experimental diets. From these results, it appears that the dietary PUFA profile influences the etiology of CRC. Studies investigating CRC commonly use rodent models to investigate human diseases. Typically rodents are fed diets formulated to promote growth and health, however these diets are considerably different than the Western diet in terms of macro- and micronutrients. Diet is known to influence CRC incidence, which led to the development of the Total Western Diet (TWD) by Hinze and colleagues. The TWD is a rodent diet that uses purified ingredients to match the macro- and micronutrient composition of the average American diet. However, the complex nature of whole-foods is also known to impact colon health, so the TWD was redesigned. The TWD-2 is the only whole-foods-based rodent diet that emulates the macro- and micronutrient consumption of the average American. Initiating studies using the TWD-2, in place of the AIN diets, will hopefully make the rodent a better model for human disease research.

**Fat Detection** Sep 22 2022 Presents the State-of-the-Art in Fat Taste Transduction A bite of cheese, a few potato chips, a delectable piece of bacon – a small taste of high-fat foods often draws you back for more. But why are fatty foods so appealing? Why do we crave them? Fat Detection: Taste, Texture, and Post Ingestive Effects covers the many factors responsible for the sensory appeal of foods rich in fat. This well-researched text uses a multidisciplinary approach to shed new light on critical concerns related to dietary fat and obesity. Outlines Compelling Evidence for an Oral Fat Detection System Reflecting 15 years of psychophysical, behavioral, electrophysiological, and molecular studies, this book makes a well-supported case for an oral fat detection system. It explains how gustatory, textural, and olfactory information contribute to fat detection using carefully designed behavioral paradigms. The book also provides a detailed account of the brain regions that process the signals elicited by a fat stimulus, including flavor, aroma, and texture. This readily accessible work also discusses: The importance of dietary fats for living organisms Factors contributing to fat preference, including palatability Brain mechanisms associated with appetitive and hedonic experiences connected with food consumption Potential therapeutic targets for fat intake control Genetic components of human fat preference Neurological disorders and essential fatty acids Providing a comprehensive review of the literature from the leading scientists in the field, this volume delivers a holistic view of how the palatability and orosensory properties of dietary fat impact food intake and ultimately health. Fat Detection represents a new frontier in the study of food perception, food intake, and related health consequences.

**Tandem Mass Spectrometry of Lipids** Mar 04 2021 The emerging field of lipidomics has been made possible because of advances in mass spectrometry, and in particular tandem mass spectrometry of lipid ions generated by electrospray ionization. The ability to carry out basic biochemical studies of lipids using electrospray ionization is predicated upon understanding the behaviour of lipid derived ions following collision induced decomposition and mechanisms of product ion formation. During the past 20 years, a wealth of information has been generated about lipid molecules that are now analysed by mass spectrometry, however there is no central source where one can obtain basic information about how these very diverse biomolecules behave following collisional activation. This book brings together, in one volume, this information so that investigators considering using tandem mass spectrometry to structurally characterize lipids or to quantitate their occurrence in a biological matrix, will have a convenient source to review mechanism of decomposition reactions related to the diversity of lipid structures. A separate chapter is devoted to each of seven major lipid classes including fatty acids, eicosanoids and bioactive lipid mediators, fatty acyl esters and amides, glycerol esters, glycerophospholipids, sphingolipids, and steroids. Mechanistic details are provided for understanding the pathways of formation of major product ions and ions used for structural characterization. In most cases specific ancillary information has been critical to understand the pathways, including isotope labeling and high resolution analysis of precursor and product ions. For a few specific examples such data is missing and pathways are proposed as a means to initiate further mass spectral experiments to prove or disprove pathway hypotheses. While this work largely centres on the lipid biochemistry of animal (mammalian) systems, general principles can be taken from the specific examples and applied to lipid biochemistry found in plants, fungi, prokaryotes and archeal organisms.

**Eat for Life** Jan 26 2023 Results from the National Research Council's (NRC) landmark study Diet and health are readily accessible to nonscientists in this friendly, easy-to-read guide. Readers will find the heart of the book in the first chapter: the Food and Nutrition Board's nine-point dietary plan to reduce the risk of diet-related chronic illness. The nine points are presented as sensible guidelines that are easy to follow on a daily basis, without complicated measuring or calculating and without sacrificing favorite foods. Eat for Life gives practical recommendations on foods to eat and in a "how-to" section provides tips on shopping (how to read food labels), cooking (how to turn a high-fat dish into a low-fat one), and eating out (how to read a menu with nutrition in mind). The volume explains what protein, fiber, cholesterol, and fats are and what foods contain them, and tells readers how to reduce their risk of chronic disease by modifying the types of food they eat. Each chronic disease is clearly defined, with information provided on its prevalence in the United States. Written for everyone concerned about how they can influence their health by what they eat, Eat for Life offers potentially lifesaving information in an understandable and persuasive way. Alternative Selection, Quality Paperback Book Club

**Metabolic Syndrome Pathophysiology** Jan 02 2021 Metabolic Syndrome Pathophysiology: The Role of Essential Fatty Acids provides current research exploring the links among insulin, insulin receptors, polyunsaturated fatty acids, brain growth and disease. Specific interactions of essential fatty acids and polyunsaturated fatty acids in brain development and several disease groups are described. The role of inflammation in disease and how fatty acids regulate low-systemic inflammation are examined and explained. Metabolic and neurologic dynamics are presented to provide a linkage between the presence of omega-3 and omega-6 and protection against diseases and conditions such as diabetes mellitus, obesity, autoimmune diseases and hypertension.

**Possibilities for Improving the Fatty Acid Composition of Oil Palm** Feb 15 2022

**Fatty acid profile of halophytophthora spp. from Philippine mangrove leaves** Dec 21 2019 Studies on marine-sourced fatty acids have gathered significant interest recently, not

only due to their bioactive properties, but also as an important component of aquaculture feeds and of biofuel production. Oomycetes, also often referred to as water molds, are fungoid-like eukaryotic protists classified under Phylum Heterokonta. One group of marine oomycetous organisms are the Halophytophthora, which are known to have an important role in leaf decomposition thereby changing the plant debris into nutritious food usable to consumers in mangrove ecosystems. Recent studies in Oomycetes such as Pythium and Phytophthora, predominantly those species from freshwater and terrestrial environments have been shown to produce eicosapentaenoic acid (EPA) and arachidonic acid (ARA). The most common PUFAs with beneficial health effects are the decosahexaenoic acid (DHA), eicosapentaenoic acid (EPA) and arachidonic acid (ARA). DHA sourced from marine organisms have been extensively studied as well particularly the scale-up production of microalgae and thraustochytrids. In addition, Halophytophthora spp. cultured from fallen mangrove leaves in Taiwan have been examined for the production of such fatty acids where significant results were recently reported. However, studies on fatty acid composition of Halophytophthora spp. from the Philippines are not yet explored. This study therefore aims to isolate Halophytophthora spp. from select mangrove forests in the Philippines and to determine their fatty acid profile through FAME analysis. In this study, mangrove leaves were collected from mangrove forests in Buswang, Kalibo, Aklan ; Sta. Maria, Davao Del Norte and Pagbilao, Quezon, Philippines. Yellow to brown-colored fallen mangrove leaves cut into strips were imprinted on V8-clarified agar medium for the isolation and purification of Halophytophthora. Three selected species from each are were subjected to growth and sporulation experiments for observation of their morphological characteristics. Of these three Halophytophthora isolates, two were identified morphologically as Halophytophthora vesicula (AK1YB2) from Aklan and (PQ1YB3) from Pagbilao, Quezon and the third one, as Halophytophthora spinosa var. spinosa (ST1YB3) from Sta. Maria, Davao del Norte. These were further subjected to different growth parameters (salinity level and pH) to determine their optimum growth conditions. These isolates were grown on both V8 and PYG broth media for biomass production prior to their fatty acid composition analysis by capillary Gas Chromatography (GC). The obtained results on GC analysis were analyzed based on the comparison of retention times of the fame standard used and the fatty acid composition of the samples. The three Halophytophthora species were able to produce significant levels of industrially important fatty acids such as linoleic acid, vaccenic acid, and arachidonic acid.

**The Fatty Acid Composition of Certain Bovine Tissues** Sep 29 2020 In this study subcutaneous, inter- and intramuscular fats from 42 Hereford steers were analyzed for their fatty acid composition using gas-liquid chromatography. The same tissues were analyzed from one pair each of identical twins of Angus and Shorthorn breeding. Muscle and liver lipids from these latter four animals were fractionated on silicic acid columns into glycerides and phospholipids prior to the fatty acid analysis. Feedlot performance and carcass characteristics data were also available on these animals. The data were analyzed statistically using analysis of variance techniques and simple correlations were calculated between all the variables studied with the exception of linolenic acid. Of the ten fatty acids quantitated, only the 17-carbon fatty acid and an 18-carbon branched chain acid were found to differ significantly between rations. Since both these acids are believed to be synthesized by certain rumen bacteria, these differences may reflect conditions in the rumen. No direct evidence is available. However, it is probable that this involves the availability of suitable precursors or rumen conditions favorable to these species of organisms. A highly significant relationship ( $r = .47$ ) was found between average daily gain and linoleic acid. This relationship is probably also influenced by conditions in the rumen. A more rapid rate of passage or other factors which result in less extensive hydrogenation of polyunsaturated acids might also be conducive to more rapid growth. Essential fatty acids, such as linoleic, might be expected to reduce growth rates when they are deficient, however, no evidence of such a deficiency existed. Backfat thickness gave highly significant negative correlations with both myristic ( $r = .44$ ) and palmitic acid ( $r = .46$ ) and was positively related to the 17- and 18-carbon fatty acids with the exception of stearic. Rib-eye area/CWT and estimated cutability, conversely, were positively and highly significantly correlated with the 14- and 16-carbon fatty acids and showed a negative relationship with the longer chained fatty acids. These relationships may indicate metabolic differences between the animals which deposit more lean tissue with less fat and those depositing greater amounts of fat. If, as these data indicate, meatier animals accumulate more of the 14- and 16-carbon fatty acids in the subcutaneous fat, a useful selection tool will be provided to the animal breeder. These 14- and 16-carbon fatty acids, in general showed a positive relationship between one another. When correlated with the 17- and 18-carbon fatty acids a negative relationship was observed. These negative relationships were particularly pronounced in the case of oleic and linoleic acids. It was suggested that the substitution of shorter chain saturated fatty acids for the longer chain unsaturates is the result of an attempt by the animal to maintain physical homeostasis of its depot fats. This assumption is based on the observation that the removal of carbon atoms has the same effect on some of the physical properties as the addition of a double bond. The data obtained in this study indicated that myristic and palmitic acid were readily substituted for oleic acid. The separation of liver and muscle lipid into glyceride and phospholipid resulted in the detection of additional components. Both muscle and liver phospholipids contained large amounts of arachidonic and eicosatrienoic acids. These acids were detected only in liver glycerides. An unknown fraction was observed in both liver glycerides and phospholipids and in muscle phospholipid. This fraction may represent a fatty aldehyde since they have been previously reported in the liver as free aldehydes and as constituents of phospholipid. The only fraction showing similar trends within twin pairs was the muscle glycerides. The muscle phospholipids and all the liver fractions showed considerable variability both within and between twin pairs.

**Intakes of 19 Individual Fatty Acids** Dec 25 2022

*Nutritional Systems Biology of Fat* Jan 22 2020

**The Development and Assessment of Rapid Methods for Fatty Acid Profiling** Oct 23 2022 Fatty acid profiling provides information on dietary intakes and an understanding of lipid metabolism. High throughput techniques such as fingertip prick (FTP) sampling has gained popularity in recent years as a simplified method for basic research, and could be further used to assess disease risk in the population, and other similar high-throughput techniques have the potential to assist in the monitoring and labeling of fatty acids in the food supply. With the advancement of high-throughput sample analysis techniques, a more complete understanding of storage stability is required as a larger volume of samples are produced with equal amounts of time to analyze them. Energy-assisted analysis techniques have the potential to help ameliorate some of these issues. Presently, FTP blood, whole blood and salmon storage stability is assessed under various storage conditions, and both microwave-assisted direct transesterification and indirect ultrasound-assisted extraction techniques are assessed. It is determined that storage of FTP blood and whole blood samples at  $-20^{\circ}\text{C}$  results in significant and nearly complete highly unsaturated fatty acid (HUFA) degradation compared to all other temperatures examined. This degradation is determined to be the result of hemolysis and subsequent iron release from erythrocytes initiating fatty acid peroxidation reactions. Direct transesterification of FTP blood is reduced from as long as three hours to one minute with microwave-assisted energy and fatty acid extraction from ground flaxseed is reduced to 40 minutes from as long as 24 hours without compromising fatty acid profiles. Results of the current study provides insight into the storage stability of food sample and blood samples collected via high-throughput techniques, and provides support for the utilization of further high-throughput energy-assisted analytical methods that can help to minimize the potentially detrimental effects that long-term storage can have on fatty acid profiles.

**Free Fatty Acid Receptors** Jan 14 2022 This book highlights the important role free fatty acids (FFA) play as potential drug targets. While FFA have long been considered byproducts of cell metabolism, they are now recognized as ligands that regulate cell and tissue function via G-protein-coupled receptors. At least three receptors have been identified for which FFA appear to be the endogenous ligands.

**The Adequacy of Dietary Essential Fatty Acids in Patients With Phenylketonuria Or Hyperphenylalaninemia: A Retrospective Study** Aug 29 2020 Objective To investigate if patients diagnosed with phenylketonuria (PKU) or hyperphenylalaninemia (HPA) at the mid-south clinic had adequate essential fatty acid intakes. Design This study compared patients' intakes of linoleic (LA) and alpha-linolenic fatty acids (ALA) with Adequate Intake (AI) within an appropriate age and gender group. Data were gathered from existing food record analyses from MetabolicPro between June 2010 and December 2013. Means and standard deviations for percentage of essential fatty acid intakes were determined. A paired t-test was used to test the hypothesis that the mean intake of LA and ALA were equal. T-tests were performed to examine whether the mean percentage of each fatty acid was equal to 100%. Subjects Patients who were diagnosed with PKU or HPA, between 0- 58 years old, and had at least one 3-day food record analysis within the stated time frame ( $n=26$ ). Results Patients had inadequate essential fatty acid intakes ( $p=0.062$ ).

**Fatty Acid Composition in Four Serum Lipid Fractions and the Pathogenesis of Diabetes** Jun 19 2022 Type 2 diabetes mellitus (T2DM) is a chronic disease of glucose dysregulation leading to elevated blood glucose. Given that fatty acid and glucose metabolism are tightly entwined and that limited long-term data are available on this relationship, the objective of this thesis is to investigate the longitudinal associations of fatty acids from four lipid fractions on insulin sensitivity and beta-cell function. Data from an observational cohort of adults at risk for T2DM ( $n=477$ ) was used, where 22 fatty acids in phospholipid, cholesteryl ester, triacylglycerol (TAG), and non-esterified fatty acid (NEFA) fractions were quantified. Insulin sensitivity and beta-cell function indices were computed using glucose and insulin obtained from a 75g oral glucose tolerance test. Results from the analyses of these data show that fatty acids have differential associations with the pathogenesis of T2DM, dependent on the lipid fraction and on the species. Fatty acids within either phospholipid or TAG fractions showed varied and strong associations with insulin sensitivity and moderate associations with beta-cell function, while few associations were seen in the cholesteryl ester or NEFA fraction. Some results of particular note: higher phospholipid palmitic acid associated with 6-year declines in beta-cell function; phospholipid and TAG cis-vaccenic acid had consistent and strong beneficial associations with insulin sensitivity and beta-cell function; four TAG fatty acids strongly clustered together and higher levels strongly associated with lower insulin sensitivity, of which these four fatty acids are also indicative of higher de novo lipogenesis; and, higher total NEFA concentration associated with lower beta-cell function, independent of the specific fatty acid composition. These results emphasize that fatty acids have complex and differential associations on glucose metabolism and highlight potential areas of future research, for instance, on the de novo lipogenesis fatty acids or with cis-vaccenic acid, the study of which may lead to better prevention or management strategies for T2DM.

**The Fatty Acids Present in Human Milk** Jul 08 2021 In beginning of this thesis an effort was made to find all the available references on the subject of the chemistry of human milk fat in order that a bibliography might be made which would cover all the work done on the subject up to the present time. In order to investigate the methods for separating the fatty acids in butter fat it was found necessary to look up the work that has been done on cow's butter and in most cases to follow the same methods in this work. Compared with what has been done on the butter fat of cow's milk, very little has been done on human milk fat. The fatty acids of cow's butter have been fairly well analyzed both qualitatively and quantitatively, and the physical and chemical constants have been determined several times under varying conditions. These determinations have been worked out for various abnormalities due to disease, the feeding of different kinds of food, various degrees of starvation and thirst, etc., etc. The work which has been done on human milk fat includes a few determinations on the physical and chemical constants, a few qualitative determinations, and one or two quantitative results for some of the fatty acids. Almost all of the results differ greatly even among determinations made by the same investigator. The causes for the varying results are taken up under HISTORY. I confined my work to the qualitative determinations, and made a few quantitative determinations where it was possible. These determinations were made only on the fatty acids present as saturated and unsaturated acids.

**The Fatty Acids Contained in the Oil of the Arachis Hypogaea and the Oleic Acid Series. Inaugural Dissertation, Etc** Apr 24 2020

**Characterization of the Effects of Free Fatty Acid Receptor 4 (FFA4) Agonists on Human Cancer Cells** May 26 2020 The results of these studies establish that there are specific receptor(s) responsible for mediating the effects of omega-3 fatty acids on human cancer cells. This finding will facilitate the development of targeted pharmaceutical therapies for prevention and treatment of prostate and breast cancer. These results show for the first time the importance of the FFAR family as receptors for omega-3 fatty acids in human cancer

cells.

[Omega-3 Fatty Acids](#) Nov 12 2021

[Diet Quality and Mental Health in College Students: Impact on Dietary Factors Including Intake of Protein, Sugar, Vegetable and Omega-3 Fatty Acid on Depression](#) Oct 11 2021

Depression is one of the most debilitating disorders among youth. Many factors impact depression risk, and dietary quality is one of the most significant modifiable factors. This work was to investigate whether diet quality, including protein, sugar, vegetables, and omega-3 fatty acids' intake, had any effect on the development of depression. Data from 82 subjects were used for analysis. There was no significant relationship between Dietary Quality Index ( $p=.21$ ,  $n=82$ ) and depression based on this research. Results included total protein ( $p=.77$ ,  $n=82$ ), animal-based protein ( $p=.77$ ,  $n=82$ ), vegetable-based protein ( $p=.29$ ,  $n=82$ ), total sugar ( $p=.55$ ,  $n=78$ ), added sugar ( $p=.48$ ,  $n=78$ ), total vegetable ( $p=.56$ ,  $n=82$ ) and omega3 fatty acids ( $p=.92$ ,  $n=82$ ). These results were not up to expectations and did not conform to previous findings. Future research should be performed with a larger sample size among the college-aged population to determine the relationship between dietary factors and depression risk.

[Lipid and Fatty Acids Deposited in Cynomolgus Monkeys as a Result of Long-term Feeding of Lard-corn Oil and Partially Hydrogenated Herring Oil as Major Dietary Fats](#) Sep 10 2021

**Small Changes, Big Results** Feb 03 2021 An easy-to-start, simple-to-maintain, scientifically sound, and eminently usable twelve-week program of small steps on the road to better health Small Changes, Big Results is not about cutting all the carbohydrates out of your diet. Or replacing every single gram of sugar with omega-3 fatty acids. It's not about doing one hundred sit-ups a day, or getting on the treadmill whenever you have a free second. In fact, it's not about any of the total lifestyle-replacement gimmicks—whether diet, exercise, or pop psychology—that have swept our culture in recent years, putting untold millions of Americans on the risky roller coaster of success and failure that defines fad diets and programs. Not here. Small Changes, Big Results is about reality—the reality of what you can do, the reality of what you want to do, and the reality of what works. It's about introducing a series of small changes each week for three months in the three core areas of diet and nutrition; exercise and fitness; and emotional wellness. For each of the twelve weeks, nutritionist Ellie Krieger introduces a very finite, completely practical action plan for the week—and not only are these tasks incredibly doable, they're in fact so accessible that it's tough not to be inspired. For example, in Week 1 the nutrition task is merely to go shopping, buy some healthful pantry items, and start keeping track of what you eat; the exercise consists of taking three twenty-minute walks; and the wellness aspect is to do a five-minute breathing exercise. That's it. And it doesn't really get any harder. But these small changes do in fact lead to big results. At the end of twelve weeks, a totally unhealthy diet has been overhauled: armed with easy, delicious recipes and tips, you've removed unhelpful munchies and replaced them with healthful snacking, you've cut down on lethal trans fats while adding beneficial fat choices, you've replaced refined grains with whole grains, you're eating more fish and less red meat, and so forth. Yet you've never been forbidden to eat a single thing: instead of prohibiting entire food groups, Ellie categorizes foods as Usually, Sometimes, and Rarely—and now you should be eating more from the Usually choices, less from the Rarely category. Furthermore, you've integrated physical activity into your life, and you've developed a set of tools to help you deal with stress—you're not only eating better, but you're also exercising better and feeling better. The beauty of this program is that none of these action steps is remotely intimidating, because they're not a full immersion into a totally new lifestyle. Instead, it's a series of incremental changes—removing bad habits one by one, while at the same time adding good ones. There's nothing to scare you off—on the contrary, here's a whole book full of small changes that produce big results.

**Diet and Health** Feb 27 2023 Diet and Health examines the many complex issues concerning diet and its role in increasing or decreasing the risk of chronic disease. It proposes dietary recommendations for reducing the risk of the major diseases and causes of death today: atherosclerotic cardiovascular diseases (including heart attack and stroke), cancer, high blood pressure, obesity, osteoporosis, diabetes mellitus, liver disease, and dental caries.

- [Diet And Health](#)
- [Eat For Life](#)
- [Intakes Of 19 Individual Fatty Acids](#)
- [Isolation And Determination Of The Free Fatty Acids Of Milk Fats](#)
- [The Development And Assessment Of Rapid Methods For Fatty Acid Profiling](#)
- [Fat Detection](#)
- [Lipid Mediators](#)
- [Nistir 7953 Interlaboratory Analytical Comparison Study Of Total Fatty Acid Concentrations In Human Serum](#)
- [Fatty Acid Composition In Four Serum Lipid Fractions And The Pathogenesis Of Diabetes](#)
- [05 THE SATURATED FATTY ACIDS PALMITIC ACID AND STEARIC ACID DO NOT DIFFERENTLY AFFECT CHOLESTEROL EFFLUX CAPACITY RESULTS OF A HUMAN DIETARY INTERVENTION TRIAL](#)
- [Nutrient Analysis Of Retail Cuts Of Pork](#)
- [Interlaboratory Analytical Comparison Study Of Fatty Acid Concentrations In Human Serum](#)
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- [Free Fatty Acid Receptors](#)
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- [Mediterranean Diets](#)
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- [Tandem Mass Spectrometry Of Lipids](#)
- [Small Changes Big Results](#)
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- [Nutritional Systems Biology Of Fat](#)
- [Fatty Acid Profile Of Halophytosphora Spp From Philippine Mangrove Leaves](#)
- [An Idea Spot For A University Farm](#)
- [Alternative Sources Of Omega 3polyunsaturated Fatty Acids](#)