PROCEEDINGS

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Refereed Abstracts

Sung-Jin Lee, Editor
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African Folklore Inspirations: Creative Project Using Natural Dyes

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Purpose and Rationale: Fashion can be influenced by cultures, traditions, and practices. As a young girl, African Folktales were my favorite stories to read and I admired the portrayal of women in these stories. The pressures African women faced in these stories are relatable to me as an African American woman. Therefore, I chose African Folktales as the inspiration for this project. In Nigeria, a tribe called Yoruba, is a very high influence on dyeing and fashion. The Yoruban people use different types of dye techniques. Batik technique is very commonly used with indigo dye within Nigeria and among the tribe (Pendergast & Pendergast, 2013, pp. 401-402). This creative research explores the usage of a natural indigo dye in the batik process to showcase African Folktail inspiration and how African women are portrayed in those folktales. The creative project examines the following study questions; a) if indigo is a valid dye source to use in the batik process and b) if it will show a variation of indigo shades and tones.

Methodology: Natural indigo dye was chosen and the process to create dye solution was reviewed through literature. The study questions were examined by using different formulas of sodium hydrosulfite (reducing agent) and soda ash (fixing agent). Testing was also based on the number of dips to achieve various hues from the indigo. Batik is the process of applying a wax resist to fabric before dyeing, and overdyeing to create a unique pattern on the fabric. After the dye process, all of the fabrics were boiled to remove the wax residue, rinsed, and hung dry. Draping and flat pattern techniques were used to create patterns for the design ideas for the garments. Based on the result of the dye experiments, fabrics with the best dye quality were chosen to create the garments.

Findings: Various shades of blues and purples from the indigo were shown based on the amount of sodium hydrosulfite used. The dye result was presented in a swatch book. Batik designs were incorporated on the fabric, but it was shown that dye could infiltrate the wax altering the design. The garments include a dress and a two piece – top and skirt representative of modern look, yet infused with the traditional look of the Yoruban and Nigerian dress.

Conclusion: With intricate batik designs, the garments showcase a modern, yet traditional West African look. The findings of this project can be applied to create other garment designs to increase the ethnic looks in fashion markets. The research is also an example of socially responsible practice in garment production using natural dyes.


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The Effects of a Parent-Implemented Infant Signing Intervention

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**Purpose and rationale:** The session will present intervention methods and results from a parent-implemented infant signing intervention with young hearing children with diagnosed language delays. Implications from this research for early childhood practitioners and families from a variety of settings (e.g., inclusion, early intervention) will also be discussed.

Being able to communicate one’s wants and needs is an essential step in typical language development. However, children with diagnosed language delays, which constitute approximately 5–10% of children under three years, may reach this step later than typically developing children. Communication skills are the most highly correlated to future school performance than any other. The use of infant signing, a form of intentional symbolic gesturing, has been shown to support children’s development in multiple domains for both typically developing children and children with disabilities. However, there is limited research showing the effects of infant signs on young hearing children’s communication skills.

**Methodology (including research design, data collection, and analysis procedures):** The current study examined the potential effects of an infant signing intervention program on children’s communication skills, both verbal and sign usage. The researcher conducted a single subject, multiple probe research design across three children (ages 12 to 36 months) with diagnosed language delays to study their communication skills before and after the signing intervention. A pre- and post-study child language inventory supported with qualitative data collection methods was used as well.

Primary caregiver sign training began after at least five baseline probes were taken for their child, however the timing differed for each participating family depending on their order of entry within the study. Sign training was completed by the researcher with the primary caregiver after the three signs/words were decided on. The targeted signs/word were based on what the primary caregiver felt would be most motivating and interesting for the child to learn (Tait et al., 2004) and would be the most beneficial for the child in terms of getting his/her wants and needs met. The three signs/words were all tangible items in the child’s regular natural environment, or “object signs.”

The training session taught the primary caregiver how to implement the intervention with the child during the entire study as well as how to introduce the child to the signs during the first day of the intervention. During the training session, the researcher taught the primary caregiver how to create the manual sign for the chosen words with the primary caregiver repeating the signs. Each sign was also shown to the primary caregiver on the website www.handspeak.com in order to ensure the correct manual production of the sign in American Sign Language (ASL) was taught.

**Findings:** Results suggest an increase in communication attempts via both spoken and manually signed words after a primary caregiver-implemented infant signing intervention. Overall, Child 1 produced 33 total responses, Child 2 produced 48 total responses, and Child 3 produced 31 total responses. Across all three children, 41 (36.6%) of all responses were independent/spontaneous and 71 (63.4%) were prompted by a primary caregiver. A functional relationship was seen between the independent variable (i.e., parent implemented infant signing intervention) and the dependent variable #1 (i.e., number of prompted child responses), but not between the independent variable and dependent variable #2 (i.e., number of spontaneous/independent child responses).

**Conclusions and Implications for research and/or practice:** For researchers, the current study adds to the literature suggesting the benefit of signing for young hearing children with language delays. For practitioners, results suggested a correlation between vocabulary production and signing. Finally, this study supports the notion that parents are able to serve as interventionists!

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REFEREED ABSTRACTS - POSTER PRESENTATIONS
Perspectives of American Cultural Standards of Dress and the Body through Course Blog Development

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Purpose and rationale: The purpose of this qualitative study was to explore undergraduate African American students’ perspectives of American cultural standards of dress and the body through course blog development.

Methodology: Undergraduate students’ blog entries addressing dress, appearance and the body were examined for various themes of cultural standards. Students were allowed to either freely discuss the topic without restrictions or to discuss specific points including American cultural standard of beauty, comparison of one self to the standard, the reality of achieving the standard, prediction of any changes in current standards, and lastly to discuss if the American standard was consistent among the major ethnic groups in the United States. Thematic analysis of 22 blogs were reviewed in a qualitative approach to identify patterns across blogs written by undergraduate students enrolled in FCS 181 – Social and Psychological Aspects of Dress during the fall of 2015. Thematic analysis is a widely used qualitative data analysis method that allows researchers to identify themes from written data (The University of Auckland, 2016). Participants/ Bloggers: Females represented 86% (N=19) while males represented 14% (N=3) of the bloggers. FCS 181 is a general education course. Enrolled students represented a range of majors and classifications including fashion merchandising and design, psychology, sociology, engineering, biology, and sports science.

Findings: Three themes emerged from the blog reviews. 1.) Unrealistic Standards. Ninety-six percent (N=21) indicated that the perceived and prevailing standards of beauty and body were unrealistic; 46% (N=10) of participants stated that it is personally difficult to meet the standards. 2.) Body Satisfaction and Dissatisfaction is described as having the confidence to acknowledge and accept one’s physical differences when compared to prevailing standards of beauty. Half of the participants (N=11) acknowledged personal and physical flaws and 41% (N=9) stated they were satisfied with their bodies and unique physical features that contrast mainstream standards. 3.) Media/Celebrity Influence. Use of (social) media such as Instagram and YouTube by celebrities and young adults are used to guide beauty and dress decisions. Ninety-six percent (N=21) referenced or pictured celebrities in the blog post; 46% (N=10) of participants stated sources of media featuring celebrities who provide guidance or influence.

Conclusions and Implications for research and/or practice: Course blogging provides students the space to share ideas, reflect and have a voice in social topics and classroom discussions. Bloggers described dual body standards for American women today, which were both considered unrealistic. Male and female bloggers accepted their physical features and body size/shape although they did not meet the cultural beauty and body standards. Celebrities such as Kim Kardashian and Beyoncé were believed to serve as the prototype of a specific standard of beauty. Both male and female students follow social media and certain celebrities who they believe are instrumental in the sharing and promotion of beauty standards. Marketers can use this information to more effectively promote products and services to young adult African-Americans.

References

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Awareness of Breakfast Importance and Satisfaction of Eating Habits among Historically Black College and University (HBCU) Students

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Purpose and Rationale: Breakfast is the first and metabolically most important meal of the day after overnight fasting (Zilberter & Zilberter, 2014). Haines, Guilkey, and Popkin (1996) found breakfast skipping is more prevalent among college students than pre-college stage students. A concern is that college students who are recognized as breakfast skippers have a higher body mass index, implying they are either overweight or obese (Jeneta & Preetha, 2016). More attention needs to be given to African American college students because they are likely to be breakfast skippers, as well as, more overweight/obese than other racial and ethnic groups (Thiagarajah & Torabi, 2009). Thus, there is a need in examining HBCU students’ awareness and eating habit satisfaction.

Methodology: Between September 2016 and October 2016, 289 college students voluntarily participated in the self-administered survey at North Carolina A&T State University, that is one of HBCU colleges (per N.C. A&T Behavioral IRB Study #: 16-0071). The survey included demographic questions and breakfast related questions. Descriptive statistics were used for the sample profile, and independent samples t-tests were used for comparing mean scores of students’ breakfast importance awareness levels and their eating habit satisfaction (continuous dependent variable) by a group of breakfast skippers and breakfast eaters (categorical independent variable).

Findings: Half of the students were freshmen or sophomores, 56% were female, and the majority (83%) were African American. Only 28% responded that they considered themselves a breakfast eater during their college life. In this study, there were significant differences in college students’ eating habit satisfaction scores (Scale: 1 = Strongly disagree to 5 = Strongly agree) for breakfast skippers ($M=2.80$, $SD=1.02$) and breakfast eaters ($M=3.21$, $SD=1.02$), $t(287) = -3.09$, $p < 0.05$. Breakfast skippers were less satisfied with their eating habits than breakfast eaters. Regarding the awareness of breakfast importance, there was no significant difference between breakfast skippers ($M=4.04$, $SD=0.93$) and breakfast eaters ($M=4.24$, $SD=0.91$), $t(287) = 1.66$, $p > 0.05$. Mean scores of breakfast importance awareness levels between breakfast eaters and breakfast skippers were approximately 4 for each group, implying even breakfast skippers were aware that breakfast is important.

Conclusions and Implications: The majority of students in this study skipped breakfast, while also reporting they are aware of the importance of eating breakfast. This study provides evidence that an intervention program to encourage healthy eating behaviors for HBCU students is warranted. Suggested overarching topics for such a program include time management, nutrition education, the value of nutrient-rich breakfast foods, and the relationship between food intake and chronic diseases.

References

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Factors Influencing Parenting and Work Life Choices of Modern Catholic Women

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Purpose and Rationale: The purpose of this study was to examine factors that influence modern Catholic women regarding their parenting and work life choices. The Catholic faith has core foundations which focus on procreation and strengthening family life through the presence of mothers in the household. It is often difficult for Catholic women to balance their career aspirations with their desire to live out the beliefs of their faith. According to Friedman (2013), women who stated that religion was important to them were more accepting of traditional roles and more likely to agree that in a two-career relationship one partner should be more advanced while the other partner should stay home or work part-time while children were young.

Methodology: Data collection was conducted by an online survey distributed to two private social media groups of Catholic women in the United States. The total number of completed surveys n=475. Questions regarding demographic data such as age, educational level, geographical location, household income, and number of children were asked as well as several questions regarding influencing factors that affect parenting and work life choices. Respondents rated the influencers on a 5-point Likert scale (not important, slightly important, moderately important, very important, and extremely important).

Findings: The data overwhelmingly indicate that this is a very homogeneous group of women, 89% are married in the Catholic Church, or had their marriage convalidated in the Catholic Church. Most have children with the mean number of children 2.43. The schooling choice for over 49% of these women was Catholic school. Many (56.8%) stay home full-time or part time with their children. Respondents are highly educated with over 56.87% with at least a bachelor’s degree and 21.8% with a master’s degree or higher. About 25% have household incomes between $70,000-$99,999; 23% have household incomes between $100,000 and $149,999 with 13.68% with household incomes above $150,000. Religious/spiritual values are reported by over 82% of these women as a very important to extremely important factor that influenced their work/life choices.

Conclusions/Implications: Some of the similarities among these women may be because of the convenience sample this population represents from Catholic Women private social media list serves used to gather data. These Catholic women rated their religious/spiritual values highly and may be portrayed as accepting traditional values as Friedman (2013) suggest. Women that are married mothers, highly educated with high household incomes may have more flexibility in their parenting and work life choices because of the stability and security their family structure provides. Further research should examine the impact of women’s religious/spiritual values on predicting family structure, educational attainment, and family household income.

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Quercetin, a functional compound of onion peel, remodels white adipocytes to brown-like adipocytes

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Purpose and Rationale: Obesity causes various chronic diseases including cardiovascular disease, diabetes, insulin resistance and osteoporosis [1]. Inhibition of fat accumulation (lipogenesis and adipogenesis) and stimulation of energy expenditure (fatty acid oxidation) have been considered typical scientific approaches to prevent obesity and obesity-related diseases. Recent findings suggest that induction of brown adipose tissue activity and white adipose tissue browning, which utilize fat for a non-shivering thermogenesis, would be a potential solution for obesity [2-3]. Various functional foods, such as turmeric, ginseng, and pepper have been attracted for a candidate for brown adipose tissue activation and browning of white adipose tissue. Previously, our group found that onion peel methanol extracts induced white adipocyte browning. However, the major functional compounds of onion peel for the beneficial effect and its underlying mechanism are still unclear. Therefore, the purpose of this study was to identify the functional compounds of onion peel extract and investigate the underlying mechanism of adipocyte browning effect by onion peel extract.

Methodology: 3T3-L1, fibroblasts that mimic white preadipocytes were cultured and differentiated into mature adipocytes. Cells during differentiation were treated with various concentrations of onion peel extracts (OPE) obtained through 60% ethanol, and two fractions of OPE including ethyl acetate fraction (OPEF) and water fraction (OPWF). The expression of mRNA and proteins levels involved in lipogenesis, adipogenesis, beta-oxydation and thermogenesis were measured using real-time PCR. Lipid droplets in the 3T3-L1 were stained with Oil Red O. Functional compounds of OPE, OPEF, and OPWF were analyzed using high performance liquid chromatography analysis (HPLC) analysis. One-Way ANOVA (p < 0.05) with Tukey’s post hoc test were conducted to perform statistical analysis using Graphpad prism.

Findings: OPE, OPEF but not OPWF induced the expressions of mRNA and protein associated with BAT and browning characteristics and fatty acid oxidation. These effects were supported by decreased lipid levels and multiple small-sized lipid droplets. In addition, OPE, OPEF but not OPWF decreased the expressions of mRNA and protein related to lipogenesis and adipogenesis. HPLC analysis identified quercetin as a functional compound of OPE for the browning effects on 3T3-L1 cells. It was found that the quercetin-associated browning effect was mediated in part by activation of AMP-activated protein kinase (AMPK) by treatment with dorsomorphin treatment, AMPK inhibitor, with quercetin [4].

Conclusions and Implications: Our findings indicate that quercetin in onion peel has the potential to prevent obesity by remodeling the characteristics of white adipocytes to those of brown-like adipocytes. Onion peel may be a useful by-product of foods to reduce the prevalence of obesity.

References

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Assessing Financial and Sociocultural Factors of Healthy Food Consumption among Rural African American Families: A CBPR Approach

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**Purpose and Rationale:** Limited access to health services due to geographic isolation, combined with high poverty rates in rural areas, create problems particularly knowledge of and access to healthy and nutritional foods. These concerns are heightened for African American families and children in rural communities who are often poor and disproportionately affected with health-related problems and obesity. This study utilized a Community-Based Participatory Research (CBPR) model to promote collaborative inquiry and to provide strategies for contextualizing interventions of health and well-being of African Americans in a rural community. The CBPR approach allowed community involvement and participation in addressing socio-cultural factors which influence healthy food consumption. The primary aim of this study is to present participants’ perceptions of the financial and cultural barriers that influences food selection and preparation.

**Methodology:** This mixed-methods study utilized nutritional and dietary assessments as well as community health forums, focus groups and other venues for educators and community leaders to discuss social cultural concerns of health disparities and obesity that impacts short-term and long-term health concerns of among African American families.

**Findings:** Through purposeful dialogue, participants shared social, cultural as well as economic factors which serves as barriers to the consumption of healthy foods. For example, participants highlighted lack of resources to purchase healthy foods as well as cultural beliefs on eating patterns and dietary habits as a major concern. Community leaders also noted the poor quality of fruits and vegetables in the grocery stores and discussed possibly developing farmer’s markets or community gardening.

**Conclusions/Implications:** It is critical to recognize the financial and cultural barriers of rural African American families and its relation to health disparities. The CBPR has shown to be effective in c in predominately low-income communities and communities of color as a viable approach for addressing health disparities. CBPR facilitates capacity building and behavioral change within a community setting and allows equal involvement of academic researchers, community members, and practitioners to contribute their expertise and share responsibilities. The study has practical implications for family life educators, researchers, health educators and extension agents who can use similar strategies to promote healthy eating and physical activity for rural African American families.

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A New Substitute for Dairy Protein in Surimi Manufacturing

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Purpose and Rationale: Addition of whey proteins to surimi seafood do not form fine gels in the presence of 1.5 to 2% salt. Also, whey proteins pose a challenge to the food industry due to its allergenicity. Camel milk is similar to human milk but it contains a higher percentage of β-casein which contributes to its higher digestibility rate and lower incidence of allergy. To date, the effect of camel milk on physico-chemical properties of surimi seafood has not been studied. The objectives of this study were to determine (1) textural and color properties; (2) TBARS values; (3) cooking loss and (4) sensory attributes of Alaska Pollock surimi gels formulated with constant protein, but variable amount of camel milk.

Methodology: In this study, Alaska Pollock surimi gels were prepared with final moisture of 78%. Camel milk was added at 0% (control), 25%, 50%, 75%, and 100% by replacing chilled water at 1:1. Surimi pastes were stuffed in stainless steel tubes and cooked at 90 °C for 15 min. The color of surimi gels was tested by measuring L*, a*, and b* tristimulus color values. Texture was measured using texture profile analysis, and Kramer shear test. The difference between factors and levels was evaluated by analysis of variance (ANOVA). Tukey test was used to compare the means to identify which groups were significantly different from other groups (P< 0.05).

Findings: Addition of camel milk generally improved the textural properties and significantly increased (P<0.05) the whiteness values. Lipid oxidation of surimi seafood slightly increased. Total cooking loss was reduced significantly (P< 0.05) which was the lowest at 100% camel milk. No significant difference (P>0.05) was observed in sensory scores of surimi seafood.

Conclusions and implications for research: This study suggests that camel milk may provide an alternative source of dairy protein for surimi manufacturing by improving the quality as well as reducing the allergenicity. Further, the nutritional value of camel milk is not less important than other kinds of milk from various animal species. Camel milk is an excellent source of vitamin C; it contents of vitamin C three times to five times higher than that in bovine milk. Therefore, this will enable food industry to provide varieties to surimi manufacturing with health benefits.

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Shelf-life of Fresh Eggs is Extended by Application of Edible Coating

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Purpose and Rationale: Eggs are perishable and lose their quality during storage. Consumers’ demand for safe, minimally processed food products and concerns about the impact of the use of nonrenewable petroleum-based food packaging on the environment pose major challenges and opportunities for the food and packaging industries. This has led to a renewed interest in edible coating materials based on biopolymers such as starches and other renewable sources. Wheat starch, chitosan, wheat gluten, soy, and whey proteins have frequently been used for biodegradable coating while there is a potential allergenicity if these compounds migrate onto edible products. However, sweet potato starch can be used to overcome this issue as there is no report of allergenicity.

Methodology: In this study, sweet potato starch (SPS)-based edible coatings were prepared with variable levels of thyme oil (TO) including 0 (control), 2.0, 4.0 and 6.0% and were applied on eggs to investigate the quality attributes including shell breaking strength, egg albumen index, yolk index, Haugh unit, shell thickness, weight loss, yolk and shell color, and pH of the coated eggs during 7 weeks of storage at 25 and 4 C. The difference between factors and levels was evaluated by analysis of variance (ANOVA). Tukey test was used to compare the means to identify which groups were significantly different from other groups (P< 0.05).

Findings: For uncoated eggs as storage time increased, albumen pH and weight loss increased but yolk index, albumen index, and Haugh unit values decreased. Application of 4.0 and 6.0% TO in SPS-based coatings maintained the internal quality of eggs (with a final B grade) 2 weeks longer than non-coated eggs at 25 °C. At 4 °C, SPS-based coated eggs went from AA to A grade after 6 weeks and maintained the grade for 7 weeks (3 weeks longer than that of non-coated eggs). After 7 weeks of storage at 4°C, SPS-coating with 4.0 and 6.0% TO decreased weight loss, and albumen pH but yolk index, albumen index and Haugh unit values increased.

Conclusions and implications for research: The results of this study suggest that the TO incorporation at 4% into SPS coating could be useful in extending the shelf life of eggs during storage time.

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Effect of Nanoparticles and Essential Oil on Physical Characteristics of Biodegradable Films

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Purpose and Rationale: There are increasing public concerns regarding the environmental pollution caused by excessive waste from packaging materials. Indeed, food packaging is one of the main contributors to this waste although some materials can be recovered and recycled. Sweet potatoes starch (SPS) is a biodegradable polymer with excellent film forming properties, availability, and low cost. On the other hand, starch films are often limited by their barrier properties. Application of nanoclays such as montmorillonite (MMT) in the films could overcome this limitation by manufacturing the nanocomposites. At the same time, these nanocomposites could be a good vehicle for functional ingredients such as antibacterial compounds to enhance the shelf life of the packaged products.

Methodology: In this study, the bio-nanocomposite films were prepared from SPS. MMT was incorporated at 3% (w/ w) into SPS films to improve the physical and mechanical properties. Films were activated by four selected concentrations of thyme essential oil (TEO) at 0, 2, 4, and 6% (v/v) to enhance the antimicrobial properties. Films without TEO and MMT were considered as control. The physical, mechanical, barrier, and optical properties of the film were evaluated for its potential application as a food-packaging material. The difference between factors and levels was evaluated by analysis of variance (ANOVA). Tukey test was used to compare the means to identify which groups were significantly different from other groups (P< 0.05).

Findings: The physico-mechanical properties of SPS-based film were improved by addition of MMT nonclay. These improvements included significant increase (P<0.05) in the tensile strength (TS), elongation at break (E %) and young modulus (YM) of SPS-based films when compared with the control. However, incorporation of different levels of TEO into the SPS/MMT nanocomposite films caused significant reduction in TS and YM (P<0.05). In contrast, the E % value showed significant improvement (P < 0.05) with 2% (v/v) TEO. Incorporation of different levels of TEO slightly affected the resulting film thickness. Also, the combined effect of MMT and TEO improved tristimulus color values.

Conclusions and implications for research: These improvements could be related to the MMT exfoliation and good interaction between SPS and MMT in the presence of TEO. These results suggest that SPS may provide a viable solution to the waste disposal of foods’ plastic packaging materials.

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Microstructure of Nanocomposites Films with Sweet Potato Starch

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Purpose and Rationale: Sweet potato starch (SPS) is a biodegradable polymer with excellent film forming properties and relatively low cost. However, technological applications of starches revealed their limited mechanical properties compared to conventional synthetic polymers due to its hydrophilic characteristic. Montmorillonite (MMT) is the most commonly used natural clay and has been successfully applied in numerous nanocomposite systems. Thus, it may improve the mechanical and barrier properties of starch. Food plastic packaging contributes to substantial plastic waste discarded in the environment annually. The suggested biodegradable nanocomposite film made from SPS in this study may provide a viable solution to the waste disposal of foods’ plastic packaging materials.

Methodology: In this study, MMT and thyme essential oil (TEO) were incorporated into SPS film to improve its physical and mechanical properties. The MMT weight percent relative to SPS was 3% and was activated by four TEO levels (0%, 2%, 4% and 6% v/v). Microstructure of SPS/MMT/TEO nanocomposites was characterized by using X-ray diffraction (XRD), scanning electron microscopy (SEM) and Fourier transform infrared spectroscopy (FTIR).

Finding: The functional properties of SPS based film were improved by adding 3% MMT. FTIR spectra and XRD results showed strong interaction between the MMT and SPS. This fact indicates that –OH group of SPS formed hydrogen bonds with the –OH group of MMT. Further, hydrogen-bonding interaction between SPS and clay is enhanced in the presence of TEO. The structure of nanocomposites is not affected by the presence of the TEO. SEM images confirmed the X-Ray results.

Conclusions and implications for research: It was observed that the SPS-MMT nanocomposites, exhibited markedly improved packaging properties due to their nanometer size dispersion. Consequently, SPS-based nanocomposite packaging substances with functional properties have a huge potential for application in the active food packaging industry.

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Grape Pomace Content and Digestibility of Extruded Products

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**Rational:** Extrusion cooking is a multi-step, multi-functional and short-time thermal/mechanical process. This food processing technology has many beneficial effects including the ability to destroy antinutritional factors and microbes while increasing the digestibility of protein and starch which makes extrusion well-suited to producing nutritious foods for at-risk populations, particularly infants and children, but it also caused some undesirable effects such as reduced insoluble dietary fiber and increased starch digestibility. Consumption of rapidly digested starch can cause a rapid rise in blood sugar and insulin levels after meals that can lead to insulin insensitivity and Type 2 diabetes, and may be partially responsible for obesity.

**Objective:** The primary purpose of this study was to investigate the influence of grape pomace in corn-based product on dietary fiber content and starch digestibility of extruded foods.

**Methodology:** Yellow corn grits was mixed with 0, 2.5, 5 and 10% of Muscadine Carlos grape pomace. The formulas were extruded at 160°C and 175 rpm but different moisture level (13, 15 and 17). The effects of grape pomace content on digestibility of extruded product was evaluated using total dietary fiber (TDF) contents and starch digestibility of the products. The TDF was determined by AOAC method and the starch digestibility was evaluated by determine reducing sugar content of amylase digested product. At each moisture content, the products without GP was used as control.

**Results:** As GP content in the formula increased, the total dietary fiber in extruded products increased, but the reducing sugar content of digested product decreased indicating the reduced digestibility of product and starch. At same GP content, the starch digestibility of extruded food was affected by moisture content of mixed ingredients. As moisture increased, the reducing sugar released during product digestion decreased.

**Conclusion:** Inclusion of GP in the formula of extrusion process reduced overall product digestibility and starch digestibility. Therefore, adding grape pomace in the extruded product may be good for overweight population and people with Type-2 diabetes.

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Nutrient Absorption of Rats Fed High Cholesterol Diets Containing Different Amounts of Grape Pomace

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Rational: Excessive intake of energy dense foods and lower intake of fiber rich foods such as whole grain and fresh produce are major contributing factors of the current overweight and obesity epidemic. Both in vitro and in vivo studies found that GP polyphenols significantly inhibit the activities of digestive enzymes such as α-amylase, alpha-glucosidase, lipase and protease which could lead to reduced absorption of macronutrients and weight gain. Grape pomace (GP) is rich in health promoting polyphenols and dietary fiber, and it may regulate energy intake and weight gain.

Objectives: This study investigated the effect of polyphenol and fiber rich grape pomace (GP) on food intake and nutrient absorption.

Methodology: Twenty adult Sprague Dawley male rats of 15-week old were randomly assigned to one of the four treatment groups fed diet containing 1% cholesterol and 0, 7.71, 15.42, 2 and 23.12% GP. The group fed with 0% GP diet was used as control. Feed consumption, body weight and fecal sample of each group were measured weekly. The proximate composition including moisture, ash (minerals), crude protein and crude fat of fecal samples were determined experimentally, total carbohydrate of fecal material was obtained by difference. Data collected were analyzed by ANOVA.

Results: Data show that feed consumption and body weight of each group was significantly affected by treatment time, but not by diet GP content. Total fecal protein contents were not significantly different among treatment groups, but total fecal fat and ash contents decreased as diet GP content increasing, while total fecal carbohydrate increased with GP content. As GP content increased from 0% to 23%, fecal fat content changed from 10% to 4%, and ash content changed from 16% to 8%, while carbohydrate content increased from 55% to 70% (dry base). Results suggest that GP in the diet increased fat and mineral absorption, but decreased carbohydrate absorption.

Conclusion: This study demonstrated adding GP in the diet had significant impact on the absorption protein, lipid, carbohydrate and minerals. However, the study has certain limitation because the total fecal weight of each treatment group was not measured, thus solid conclusion about the influence of GP on the absorption of different nutrients was unable to make.

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Effect of Post-Enzyme Treatment Roasting on the Allergenicity of Peanut

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**Rational:** Peanut allergy is a severe and lifelong type of food allergy triggered by allergenic proteins and peptides in peanuts. Our previous studied show that enzymatic treatment of peanut can effectively reduce allergenic properties. However, some studies showed that glycation of peanut allergens with sugar during dry roasting enhanced allergenicity of roasted peanuts. In the case of raw peanuts, roasting after enzyme treatment is necessary for consumption and other applications, but may result in the formation of new allergens. Because the presence of sugar in the natural peanut, it is necessary to evaluate the effect of roasting after enzyme treatment on the allergenicity of roasted peanuts to ensure the safety of the product.

**Objective:** In this study, the effect of post-enzymatic treatment roasting on major allergen contents and the immunoreactivity of raw Virginia Peanuts were investigated.

**Methodology:** Raw peanuts were treated by single, two and three enzyme treatments respectively, under previously determined optimum treatment parameters. Enzyme treated raw peanuts were dried with vacuum oven then roasted in a kitchen oven at 325°F. All raw and roasted samples were ground into butter. enzyme treated non-roasted and non-enzyme treated roasted peanut sample were used as controls. Reduction of four major allergens, Ara h 1, Ara h 2 and Ara h 6 were evaluated by sandwich ELISA and SDS-PAGE, and allergenicity of peanuts were evaluated by competitive inhibition ELISA method and Western Blot methods.

**Results:** Sandwich ELISA and SDS-PAGE results show that roasting of enzyme treated peanuts reduced the total soluble protein and Ara h 6 contents, but did not affect Ara h 1 and Ara h 2 contents in the extract. In addition, roasting did not affect the *in vitro* IgE-binding of enzyme treated peanut extract significantly. Western Blot shows that the allergenicity of insoluble protein of enzyme-treated roasted peanuts was slightly higher than that of non-roasted peanuts but still tremendously lower than that of untreated peanuts.

**Conclusion:** This study indicates that the allergenicity of allergen-reduced roasted peanut was significantly lower than the non-enzyme treated roasted peanuts. Consumption of enzyme treated-roasted peanuts may be safer than consumption of regular roasted peanuts.

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Effects of Particle Size of Grape Seed Flour on the Polyphenol Composition and Sensory Properties of Cookies

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Purpose and Rationale: Grape pomace (GP) has great potential to serve as a cheap source of antioxidant rich dietary fiber to improve the nutritional value of food products, and baked goods are good vehicles to deliver the health benefits of GP to consumers. Particle size reduction of grains and dietary fiber rich materials by grinding is usually demanded for better acceptance of the final products. The objective of this study is to evaluate the effects of particle size of grape seed flour (GSF) on polyphenols composition and sensory properties cookie with added GSF.

Methodology: Grape seeds from Muscadine grapes were ground into flours with average particle sizes of 104, 209 and 486 μm, respectively. The GSF of different particle sizes were added to sugar cookie formula at levels of 2.5%, 5.0%, 7.5%, and 10% (w/w). The formula without GSF was used as control. After baking, the total polyphenol concentration (TPC), flavonoids content (TFC) and condensed tannin content (CTC) in the cookies were measured, and sensory evaluation was conducted with 55 non-trained panelists. Sensory data were analyzed using ANOVA and Duncan Multiple range test.

Results: Data show that extractable TPC and TFC increased linearly with decreasing GSF particle size, but the change of condensed tannin with particle size was not linear. At 2.5% GSF content, as particle size decreasing from 486 um to 104 um, the cookie color became deeper (L*, a* and b* values decreased from 48 to 42, 6.6 to 5.6 and 9.4 to 7.6, respectively), texture became smoother, and the sensory scores for taste and texture (mouth feel) increased. Increasing the GSF content in cookie to 7.5% or higher resulted in decreasing sensory score and overall acceptability (P<0.05). Smaller particle size and higher GSF content resulted in cookies with darker color and lower sensory score.

Conclusion: The study suggests that particle size of GSF has great impact on the polyphenol extractability and sensory quality of cookies containing GSF. Therefore, the particle size of GSF needs to be controlled for better quality product. This may also apply to other baked goods.

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Effects of Different Drying Methods on Mold Viability and Ochratoxin A Content of Grape Pomace

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**Rational:** Value added utilization of grape pomace (GP) has been the interest of many food researches due to its high contents of dietary fiber and polyphenols. Ochratoxin A (OTA) is the main mycotoxin found in grapes, wines and grape juices. OTA is a mycotoxin produced by several species of *Aspergillus* and *Penicillium* fungi and has been shown to be nephrotoxic, hepatotoxic, teratogenic, and immunotoxic to several animal species and to cause kidney and liver tumors in mice and rats.

**Objective:** The purpose of this study is to evaluate the efficacy of different drying methods on mold viability and OTA content of grape pomaces of difference grape cultivars.

**Methodology:** Freeze dry (FD), room temperature dry (RTD) and vacuum dry (VD). Pomaces were ground into powder after drying. Dichloran Rose Bengal Chloramphenicol Agar (DRBC), Dichloran Glycerol 18% (DG18) and Potato Dextrose Agar (PDA) plates were used to determine the yeast and mold counts of GP samples. OTA was extracted using 70% methanol and quantified by a ELISA method.

**Results:** Result shows that ochratoxin (OTA) producing mold *Aspergillus niger* (81.10%) and *Aspergillus carbonarius* (13.51%) were confirmed to be the most dominant molds in all GP samples tested. Other molds detected were *Aspergillus fumigatus* (5.39%). Pomace produced from Chardonnay and Merlot grape cultivars were mostly populated with all three *Aspergillus* strains detected. No mold was detected in pomaces derived from Cabernet Franc and Sangiovese grape pomaces. The level of OTA in the wet pomaces varied and depended on the grape cultivars. Higher levels of ochratoxin A exceeding the 10 ng/g were detected in all wet pomace samples. Drying method has significant effects on the viability of OTA producing molds and OTA content of GP. Freeze dried and vacuum dried pomace showed lower OTA content than room temperature dried samples, but more molds were found in room temperature and freeze dried grape pomace samples.

**Conclusion:** The degree of mold contamination and OTA content of GP depended on the grape variety and agricultural practice. Fast drying after press of GP greatly reduced viable mold count and OTA content. Vacuum dry and freeze dry methods resulted in safer GP for food and feed use. The study suggests that reducing OTA content of GP is extremely important to the value added utilization of this valuable agricultural by-product.

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Copper and Lactic Acid Solution Reduces *Escherichia coli* O157:H7 Inoculated on Leafy Greens

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**Purpose and Rationale**: Food safety issues and outbreaks of foodborne illness caused by *Escherichia coli* (*E. coli*) O157:H7 in leafy greens have raised concerns among consumers. Consumers' demand for natural ingredients to control such pathogens is drawing attention to the food industry considering better alternatives. The objective of this study was to determine the efficacy of copper and lactic acid alone or in combination in decontaminating leafy greens (cilantro, parsley, and dill) that were artificially contaminated with *Escherichia coli* O157:H7.

**Methodology**: Samples (10 g of cilantro, dill, parsley) were individually submerged in an approximately 8 log cfu/ml cocktail suspension consisting of 3 *E. coli* O157:H7 strains for an hour. To allow attachment, inoculated samples were air dried under a biosafety hood for 2 hours. Samples were then kept in each treatment solutions: water, copper (Cu 50 ppm), lactic acid (LA 0.2%), and combination of copper and lactic acid (Cu + LA) for ~ 3 min. To release the bacterial cells, each leaf samples were stomached in 90 ml of peptone water at normal speed for 1 min. Sample solutions were serially diluted in 0.1% peptone water and plated on to selective agar plates. Plates were incubated at 37°C for 24 h and bacterial colonies were counted. The bacterial population for each treatment sample was converted to log CFU/gram. The experiments were conducted twice and the data obtained were analyzed by one way ANOVA. The means were compared with Duncan multi-comparison test at the p < 0.05 level.

**Findings**: Our results showed that a Cu and LA solution has an antimicrobial effect against *E. coli* O157:H7. An average pathogen reduction of 2.0 log CFU/g was achieved on the surface of leafy greens that were treated with Cu/LA combination.

**Conclusions and Implications**: These results demonstrated that combination of copper and lactic acid could be useful for improving the microbial safety of fresh produce, including leafy greens. Acceptable from a sensory standpoint still needs further investigation. However, this treatment can be used as pre washing solution to decontaminate the produce surface.

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Hydrocolloid Additives Reduce Acid Whey Waste in Greek Yogurt

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Purpose and Rationale: The production of Greek yogurt generates large amounts of an environmentally harmful waste product known as acid whey. This waste product is expensive for the Greek yogurt industry to dispose of; therefore yogurt industry is seeking a solution to decrease the production of acid whey. Hydrocolloids help bind the water and are promising additives that could be useful in reducing the quantity of acid whey in the production of Greek yogurt. Therefore, the objective of this study was to investigate the impact of hydrocolloids on acid whey production during Greek yogurt manufacture.

Methodology: Non fat milk was supplemented with gums and proteins. Gum Arabic (GA), Inulin (IN), and Pectin (PE) at 0.01, and 0.05 % (w/v), and whey protein concentrate (WPC) and whey protein isolate (WPI) at 0.5 and 1.0% (w/v) were mixed slowly into milk at 50°C with agitation. Milk without supplementation served as a control sample. The yogurt mixes were heated at 90°C for 10 min, inoculated with 3.0% of starter culture, and incubated at 40°C for 4 h (pH 4.6), then refrigerated overnight at 4°C. The next day, each sample was centrifuged (1300 g, 10 min) and acid whey production was measured by calculating the water holding capacity (WHC). An analysis of variance of the data was carried using a completely randomized design. The Tukey test was used to determine statistically different groups.

Findings: Our results showed that fortification of gum pectin and whey proteins significantly reduced the acid whey production compared to the control sample (P < 0.001). The highest WHC was 39.71 ± 0.51, 50.23 ± 0.23, and 48.86 ± 0.24% in yogurts with pectin 0.05 %, WPC 1.0%, and WPI 1.0%, respectively compared with the control (34.95 ± 0.97%).

Conclusions and Implications: Our results demonstrate that hydrocolloids can reduce acid whey and could be industrially applicable for the production of Greek yogurt.

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Decontaminating *Salmonella* on Egg Surface using Natural Solutions

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**Purpose and Rationale:** *Salmonella* contamination on the surfaces of table eggs presents a potential hazard to consumers and egg handlers. There is an increasing concern about the safety aspects of chemical solutions that are being used to decontaminate food surfaces. As a result, the food industry is looking to use more natural food preservatives that have strong antimicrobial activity to ensure safe wholesome food products. Therefore, the purpose of this study was to explore the potential of some natural solutions to decontaminate *Salmonella* on egg surface.

**Methodology:** *Salmonella* (~6 log CFU/egg) were spot inoculated on the surface of eggs that had previously sanitized with 70% ethanol. Eggs were air dried under a biosafety cabinet for ~1 h to facilitate the attachment of bacterial cells. Then each individual egg was dipped in 30 ml of Lactic acid (0.2%) plus Caffeine (0.5%), Spermine (polyamine) at 0.5, 1.0, and 2.0 mM, and sterilized deionized water for approximately 60 sec. After immersion, eggs were aseptically removed from solution, drained and dipped into 30 ml of sterilized peptone (0.1%) water, and hand-massaged 1–2 min to release the cells. A 0.1-mL sample from a serial dilution of the rinsate was surface plated onto Brain Heart Infusion (BHI) agar. The plates were then incubated for 24 h at 37 °C. The colonies were counted and the results were expressed as log CFU/egg.

**Findings:** There were 1.13 log cycle reductions with respect to the water treatment in the number of *Salmonella* cells detected when eggs were treated with the lactic acid and caffeine solution. In contrast, spermine reduced bacterial populations by 1.58, 1.12, and 0.1 log CFU/egg at 0.25, 0.5, and 1 mM, respectively. Thus, spermine appears to be more effective at lower concentrations.

**Conclusions and Implications:** These solutions could be developed as pretreatment antimicrobial solutions for the egg and poultry industries. However, in order to validate these results, further work is needed to assess the efficacy of spermine in treating other microorganisms.

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Understanding the Behaviors and Attitudes toward Dietary Supplements, Energy Drinks, and Doping of Athletes Who Participated in the 2016 Rio Olympics

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Purpose and Rationale: Each year, new dietary supplements, energy drinks, and doping become available in global markets in the world. These products are popular among olympic athletes. Therefore, athletes need to be educated regarding the impact of various ingredients, their safety, and recommendation regarding the use of dietary supplements and energy drinks. Therefore, the aim of this study was to understand the behavior and attitudes toward dietary supplements, energy drinks, and doping among professional athletes who participated in the 2016 Rio Olympics.

Methodology: A total of 164 athletes of different nationality who passed the inclusion criteria were recruited for the survey. The Team sports consisted of male and female professional athletes with ages ranging from 20 and 26 or older. The research team traveled to Brazil to collect the data for this study. The professional athletes who participate in 2016 Rio Olympics were randomly selected to participate in this study. The subjects were asked to fill out questionnaires that took about 20 minutes to complete. The survey contained nine questions ranging from frequency of usage, knowledge, and perception of dietary supplements, energy drinks, and doping. The Statistical Package for Social Science (SPSS) was used to analyze the data for all variables. The mean age and standard deviation were 22.53 ± 2.66.

Findings: A majority of athletes (n = 129; 78.66%) responded positively regarding dietary supplements. However, 73 athletes (44.51%) were found to have neutral opinions toward energy drinks. On the other hand, 118 athletes (71.95%) had negative responses regarding doping. Relating to the frequency of product use, the results showed a high percentage of athletes (n = 66; 39.76%) use dietary supplements and 59 athletes (35.98%) used energy drinks once per week. A majority of athletes (n = 157; 95.73%) responded that they were not doping. In a question relating to the main reason for consuming these products, results showed that athletes use these products for different reasons. For example, 54 athletes (32.93%) believed that dietary supplements could be used to improve their speed, strength, and power. Similarly, 65 athletes (39.63 %) reported using sports drinks for speed, strength, and power. Additionally, 98 athletes (59.76 %) reported that they use doping for other purposes that were not listed on our survey questionnaire.

Conclusions and Implications: Dietary supplements, energy drinks, and doping are being globally marketed to professional athletes for a wide variety of inappropriate uses. It is important to educate athletes regarding the proper use and potential physiological side effects of supplements. Our study also indicated that coaches are needed to be educated to help athletes make appropriate choices regarding the use of these supplements.

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The Probiotic Bacteria *Lactobacillus reuteri* is Preserved Using Choline and Derivatives as Additives

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**Purpose and rationale:** Probiotics are bacteria that impart many health benefits. These range from reducing cholesterol and inflammation to reducing the incidence of cancer and managing diabetes. Successful delivery of a probiotic, however, is a key issue. Delivering probiotics through food is common strategy, particularly though dairy products. However, in order for probiotics to impart their health benefits through a food product, large numbers of live bacteria have to be consumed. Keeping the bacteria alive in the food is a key hurdle that has to be overcome in order for a probiotic food product to be successful. Typically, bacteria die through a process of autolysis. Bacteria cause their own lysis by releasing autolysin into their environment. Autolysin is an enzyme that catalyzes the break-down of the peptidoglycan layer of the cell wall. In order to access its substrate, however, autolysin must first attach itself to the choline head of lipoteichoic acid. This attachment can be blocked using competitive analogs. Blocking the attachment of autolysin to the cell would be an effective method of preventing autolysis. By preventing autolysis, the shelf-life of probiotics could be extended.

**Methodology:** Choline and its analog hemicholinium-3 (HC-3) were assessed for their ability to block autolysis of the probiotic *Lactobacillus reuteri*. *L. reuteri* was grown in deMan, Rogosa and Sharpe broth containing lysis-inducing concentrations of potassium phosphate (6% w/v). Lysis was determined via optical density at 610 nm. Live viable cells were counted by plating cultures on agar plates. A one-way ANOVA was used to test the effect of MRS, water, choline, and hemicholinium-3 on the growth (O.D.) and viability (Log CFU) of *L. reuteri*. Significant differences among treatments were determined at $p < 0.05$.

**Findings:** A 286% and 232% reduction in the lysis of *L. reuteri* was observed for choline and HC-3, respectively. There was a 10x increase in viability (live cells) with treatment with choline and HC-3. In addition, the production of spirosin, an autolysis related protein, was attenuated.

**Conclusions and Implications:** Choline and its derivatives are promising inhibitors of autolysis that might be used to retain live viable *L. reuteri* and other probiotic strains found in probiotic food products.

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The Effects of Aspirin on the Gut Bacterium *Lactobacillus rhamnosus*

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**Purpose and rationale:** The objective of this study was to determine the long term effects of exposure to the COX-2 inhibitor, aspirin, on the growth and functionality of *Lactobacillus rhamnosus*, an important and beneficial representative strain of the gut microflora.

**Methodology:** *L. rhamnosus* was cultured in deMan, Rogosa and Sharpe (MRS) broth at 37°C. The cells were washed with 0.1% peptone water, then transferred into 9mL MRS plus 6 mg/mL aspirin, vigorously mixed and then incubated for 4 h at 37°C. Cells were transferred into MRS alone and incubated at 37°C. This procedure was repeated five times within a week after which the cells were surface plated onto MRS agar containing aspirin. One isolated colony of *L. rhamnosus* that had been exposed to aspirin was then transferred into MRS broth. This overall protocol was over 12 weeks. Protein profiles were determined using sodium dodecyl sulfate polyacrylamide gel electrophoresis (SDS-PAGE).

**Findings:** *L. rhamnosus* survived long term exposure to a sub inhibitory concentration of aspirin. The β-galactosidase activity in normal *L. rhamnosus* cells was 153 ± 2.5 Gal U.. No β-galactosidase activity was observed in cells that had been exposed to aspirin. Fifty-four percent more total protein was observed in the unexposed cells than in the exposed cells.

**Conclusions and Implications:** Over the counter (OTC) aspirin affects the growth and functionality of *L. rhamnosus* suggesting that this could be occurring to gut microflora in general. The effect aspirin could have on gastrointestinal health should be taken into account when prescribing it. The effects of other OTC drugs on the gut microflora should be similarly investigated, especially those that also function as COX-2 inhibitors.

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Health Concerns for Low-income Elderly Homeowners Aging-in-place

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Purpose and Rationale: This study focuses on health concerns for low-income elderly homeowners aging in place. The American Association of Retired Persons (AARP) reported that 88% of those aged 65 and older want to remain in their homes for as long as possible (i.e., aging in place) (Keenan, 2010). However, 80% of seniors have at least one chronic health condition, and 50% have at least two (Center for Housing Policy, 2012). Such health limitations increase their vulnerability to environmental challenges (Wahl & Oswald, 2006). Thus, deteriorated health conditions of elderly homeowners, particularly, low-income, can negatively influence their ability to age in place.

Methodology: Between 2013 and 2014, the Housing Research Team at N.C. A&T conducted personal interviews with 30 low-income elderly homeowners with health related open-ended questions (N.C. A&T Behavioral IRB Study #: 13-0130). For this study, a non-profit organization that provides home modification service assisted with sample recruitment of households. Study participants were first contacted by the housing organization and then by the Research Team to schedule an interview if they wanted to participate. Interview responses were tape recorded and transcribed for content analysis using a methodology designed to convert textual information to more relevant, manageable data (Berelson, 1971).

Findings: The average age of the elderly homeowners was 73 years old, and 50% had education of high school graduate or less. About 60% of respondents lived alone, and 97% were female. The majority (97%) reported their family income as less than $25,000 and lived in single detached houses. Thirty-nine (39) different health conditions were identified by the participants. The most frequently cited health conditions were diabetes (10), followed by blood pressure (8) and knee problems (6). Such health conditions increased their financial burden (only five mentioned receiving financial support) as reported: “Sadly, all of the medical bills add up when you have so many problems.” Five reported fall accidents in their current home, implying the home environment could affect their health outcomes. When asking about health issues as a result of staying in their current home, various responses were obtained. For example, a concern for depression was expressed as “I guess my concern with living here is just being depressed being here by myself” and a concern for physical movement at home as “I broke two bones and got this back surgery, I have to be careful.”

Conclusions & Implications: The results of the study provided information regarding health issues related to elderly people staying in their home. This study provided meaningful findings for people involved in housing and the community. In addition, this research is useful for further knowledge of challenges seniors may face dealing with improper housing arrangements which affects their health. A follow-up interview could be conducted to investigate changes with the person’s health, or changes with helpful housing arrangements.

References

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The Inhibitory Activity of Different Jordanian Medicinal Plant Extracts Against Listeria monocytogenes

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Purpose and rationale: Listeria monocytogenes is the causal agent of listeriosis, which is one of the most virulent foodborne diseases. Although listeriosis is rare, it is of public health concern because of its high case-fatality rate. Therefore, L. monocytogenes (listeriosis) is particularly problematic for the food industry as it is widespread in the environment and has ability to tolerate refrigeration, a wide range of pH, salt concentrations, and water activity. The objective of this study was to screen the antibacterial activity of different plant extracts against six strains of L. monocytogenes.

Methodology: Selected plant extracts were Anise, Cinnamon, Rosemary, Fennel, Fenugreek, Chamomile, Fir, and Eucalyptol. Disk diffusion method was used to determine the antibacterial activity of plant extracts, by applying 10 µL of the plant extract into a sterile disk. Plant extracts with strong activity were further used in co-culture test. In this test, 15 and 30 µL doses were added into the culture test tubes. Results obtained were analyzed using one-way analysis of variance of a Statistical Analysis System. Least Significant Difference (LSD) test was performed to compare any significant differences (p < 0.05) in variables between groups. Each experiment was repeated three times.

Findings: Extracts of Cinnamon, Fir, and Eucalyptol had the highest antilisterial activity and were significantly (p < 0.05) more effective than other extracts, with the inhibition zone diameter of more than 4 cm, whereas inhibition zone of Anise, and Rosemary ranged from 1-2 cm. The other plant extracts showed weak activity, with >1 cm inhibition zone. In co-culture test, Cinnamon, Fir, and Eucalyptol extracts at dose of 30 µL showed strong inhibitory effect, with more 99.9% reduction in L. monocytogenes initial counts. All the tested L. monocytogenes showed the same sensitivity trends toward all used extracts.

Conclusions and Implications: Our results showed that the natural plant extracts were effective against several strains of L. monocytogenes, which suggests that they could be used as natural bio-preservatives in many food products produced world-wide, particularly ready-to-eat vacuum packaged-meat-products.

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Rural and Urban North Carolina Parents’ Child Feeding Behaviors

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Purpose: Childhood obesity in the United States has increased over the past 20 years. The obesity epidemic has emerged as one of the most prevalent public health problems facing children. To address this issue, this study focused on parental influences on children’s eating behaviors while attending to the regional context in which they live since parents are the most influential role models.

Rationale: Research that examines behaviors that vary by geographical setting and circumstance (e.g., rural, low-income minority communities) and that contribute to weight gain among children would be beneficial toward reducing childhood obesity in the U.S.

Methodology: This study examined parental (n=60) feeding behaviors in rural and urban households. The rural sample (n=30) included participants from a WIC satellite and the urban sample (n=30) included participants from a daycare center’s afterschool program. Children were between the ages of 2-11. A modified version of the Child Feeding Questionnaire was used to collect data (July 2012-August 2012). Parents were asked to provide weekly consumption of certain meal and food types in the home, and about their efforts to influence their children’s eating behaviors.

Findings: Regarding child weight, 73% of rural children were classified by parents as having normal weight and only 3% were classified as overweight (none were classified as being obese). Most, 92% of the urban children were classified by parents as having normal weight, and only 6% were classified as overweight or obese. Parents from both settings did not differ in statistically in the frequencies of fast-food and pre-packaged meals being consumed by their children. Rural parents served home-cooked meals more frequently than did urban parents. Rural and urban parents differed in their reports of food type consumption frequencies. Rural parents reported that their children consumed more fruits, vegetables, and meats/fish/poultry.

Conclusions: Compared to urban parents, rural parents reported that they provided more home cooked meals; that their children ate more fruits, vegetables, and meats/fish/poultry; and that they generally used more restriction and pressure to regulate their children’s eating behaviors. Based on the findings, it was concluded that both types of parents tended to over-report their children were of normal weight and under-report that their children were overweight or obese, rural parents reported lower weight levels than did their urban counterparts apparently due mostly to higher rates of reporting “underweight” children.

Implications for Research: Based on the conclusions, the following is recommended for future research: 1-Deliver parent education and weight management programs to test the effectiveness in curbing childhood obesity; and 2-Incorporate geographical settings that might benefit from inclusion of a longitudinal design that examines how parents differentially contribute to childhood obesity.

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Teaching an Undergraduate Foods Lab Course Online

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Purpose and Rationale: The purpose of the study was to investigate the viability of offering an online, undergraduate, Family and Consumer Sciences Education (FACS) foods lab course for students to take on their own time, in their personal kitchens. To increase the number of undergraduate students in FACS education, East Carolina University currently offers an online degree completer option. Sixty-five percent of higher education institutions embrace online learning in their tactical preparation and development (Rehm, Allison, Bencomo, & Godfrey, 2013). Along with the new online pathway, ECU is changing their teaching practices and instruction from face-to-face to virtual, or fully online instruction. Student approval of an online course depends immensely on the instructor’s participation, receptiveness, and effective and timely feedback (Shook, Greer, & Campbell, 2013). As instructors transform to online instruction, their teaching repertoire changes and improves to meet the needs of online students. Quality online courses consist of positive student interactions, praise and reinforcement interaction from the instructor (Moore, 2014). The piloted course was highly successful with 17 students enrolled, and on track to be taught again in the spring semester of 2018.

Methodology (including research design, data collection, and analysis procedures): Research Objectives: 1. Develop an online foods lab course for FACS BS students incorporating appropriate content knowledge and best practices. 2. Pilot the course in the fall 2016 semester. 3. Implement a variety of online teaching strategies throughout the course and 4. Through ongoing reflective teaching, evaluate the effectiveness of the teaching strategies for best practice for online teaching. During July and August of 2016, the researcher developed the online foods lab course using foodmaster.org curriculum and resources from Dr. Melanie Duffrin, Dept. of Nutrition Science, in the college of Allied Science at ECU. From August to December of 2016, the online course was piloted and implemented with a variety of online teaching strategies. The researcher participated in ongoing reflection of best practices for online teaching, and evaluation of the effectiveness of the teaching strategies throughout the semester. The students participated in the course by completing a weekly reading assignment of the topic, a pre-lab quiz on the topic, and a virtual lab demonstration of the topic. Lectures included embedded videos. Students documented their lab experiences by taking pictures and videos and submitting them to the instructor. They also completed a bi-weekly discussion board to share their experiences and reflections on the course objectives. For the course final, students had to synthesize their experiences from the semester through creation of their own teacher-led foods lab demonstration, videotape it, and submit it to the instructor.

Findings: The course was taught on ECU Blackboard, and the students were assessed through their assignments and participation. Students earned higher scores on the hands-on laboratory assignments, and lower scores on the prelab quizzes and discussion boards. The instructor provided regular, timely, encouraging feedback which facilitated student success. Examples of student comments include, “You are the kind of instructor that inspires students to want to excel.” Also, “Thank you for all your awesome comments on my project they have raised my self-confidence.” Online interactive communication enhanced the connection between student and instructor. Challenges of the online foods lab course included student technology issues with uploading pictures, videos, and lab reports, as well as students missing due date deadlines.

Conclusions and Implications for research and/or practice: Online foods lab courses for college students are possible, attainable, and successful. This course provided students with an opportunity to participate in a virtual lab, on their own time, in their personal kitchens. To deliver appropriate and applicable instruction, an experienced secondary FACS teacher was the online course instructor. The instructor ensured that novice FACS teachers met the competencies required. Success with this pilot course demonstrates the feasibility of offering virtual foods lab courses to facilitate degree completion for online FACS BS students. As a result the course will be developed as a regular curricular offering and taught every 3 semesters, or as program enrollment dictates. The process for successfully developing and teaching virtual lab based online courses will be shared with other FACS teacher education preparation programs.

References


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