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Health and Nutritional Sciences Graduate
Students Plan B Capstone Projects

Health and Nutritional Sciences

2021

Health & Nutritional Sciences Free Communication Day: Spring 2021 Plan B Abstracts

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SOUTH DAKOTA STATE UNIVERSITY

Department of Health and Nutritional Sciences

Health & Nutritional Sciences
Free Communication Day
Zoom
May 4th, 2021



Free Communication Day

Section 1: 8:30 AM – 9:30 AM M.S. Sport and Recreation Administration

Project title: Local Restaurants' Marketing and Sponsorship Within Collegiate Athletics

Vig, B, Liu, H-L: South Dakota State University Brookings, South Dakota

Presenter: Brianna Vig

Advisor: Hung-Ling (Stella) Liu

Background: Corporate sponsorships, trademark licensing, and broadcasting rights within college athletics have become a multibillion-dollar business over the past decade. However, a gap in research exists within local businesses sponsorship of college athletics. Many college towns heavily rely on local businesses, specifically restaurants, to attract and retain sports fans. **Purpose:** The purpose of this study is to examine local restaurants' marketing strategies, community relations, and other sponsorship donations impacting the involvement of its collegiate sport sponsorship at the mid-major conference level. **Methods:** Purposeful sampling was used to include two local restaurant owners who participate in sport sponsorship in a Midwest college team. Semi-structured interview questions were used to acquire marketing strategies, sponsorship, asset selection, and return on investment (ROI) evaluation. **Results:** Four main themes emerged: (1) the restaurant market in a college town, (2) pursuing big dreams through marketing: advertising, branding, and community connection, (3) progression in athletic sponsorship: decision making, investment, and assistance, and (4) keys to success. **Conclusion:** Local businesses often have different timing, intensity, and strength marketing strategies compared to those on a national level. The contributions and impacts of this study include sponsorship ROI evaluation strategies for two local restaurants, brand recognition and awareness valuation from their fan bases, and asset mixture selection.

Biography: Brianna Vig is a student in the M.S. Sport and Recreation Administration program. She is a Brookings native and received her B.S. Sport and Recreation Management at SDSU in 2019. Vig currently works as a Coordinator of Partnership Services for Jackrabbit Sports Properties of Learfield IMG College. In 2018, she spent a summer completing an internship abroad with an adaptive cycling program in Santiago, Chile. Her future plans include working within collegiate sport sponsorship or marketing.

Project title: Preparing the Future of Campus Recreation

Pappan, M: South Dakota State University, Brookings, SD, South Dakota State University

Presenter: Michael Pappan

Advisor: Hung-Ling (Stella) Liu

Objective: The purpose of this study is to understand student employees in campus recreation and explore the essential transferable skills that have been suggested by NIRSA professionals. **Data Collection, Research Procedure, and Instrument:** The study was offered to all campus recreation students n=45, with 35 acceptable responses, yielding a 78% response rate. Data was collected via an online survey that consisted of three parts. (1) experience in campus recreation, such as length of working semester, working in a supervisor position (SP) or not (NSP); (2) 21-item transferable skills of Toperzer & Barcelona (2011), including five themes: leadership opportunity, performance enhancement, training and orientation, personal relationships, and professional development; and (3) demographics, such as gender, race. **Data Analysis:** Deceptive analysis was conducted to understand the students' working experience in campus recreation, opportunities for developing transferable skills, and demographics. T-tests and ANOVAs were utilized to compare students' perception of support in total transferable skills with different demographics and working experience in campus recreation. **Results:** The top three students' perceived specific transferable skills best practices were, *provide feedback and suggestions related to job performance and professional development, encourage and support students to attend conference and workshops, and use current student employees in training new hires*. No statistical difference was found on transferrable skill development opportunities between gender, whether in supervisor role or not, and experience in campus recreation. Students claim that professional staff do a great job of explain the importance of personal relationship and attempt to create them with the student employees themselves. **Conclusions:** Student employee transferrable skills can be taught in a variety of way. To make these teachings have a lasting impact they must engage the student employee in a hands-on approach and continually reflect on what has been learned.



Biography: Hi, I am Michael Pappan, I recently received my undergraduate degree from Oklahoma State University (OSU) in Business Marketing and Management. OSU is where I fell in love with campus recreation and all it had to offer. That enthusiasm eventually drove me to SDSU in which I am currently the Graduate Assistant of Competitive Sports and Summer Camps at South Dakota State University (SDSU). In my free time I love to get outside and enjoy nature through hiking, biking, kayaking, fishing, hunting, or playing nearly any sport imaginable. Throughout my time in campus recreation, I developed a passion for making an impact on student employees lives, which I determined there was no better way than to set them up for success. That passion is the reason behind the research to optimize student staff training, learning, and providing them with the right growth tools to have a successful career.

Project title: Motivational Factors Influencing College Choice: NCAA Division I Female Volleyball Athletes

Svehla, T: South Dakota State University, Brookings, South Dakota

Presenter: Taylor Svehla

Advisor: Bryan Romsa

Objective: Recruitment strategies to increase student-athlete enrollment and ultimately leading to team success deems crucial for universities to gain financial benefits, marketing opportunities, and enrollment surges. Successful recruitment relies on understanding what appeals to prospective student-athletes. The purpose of this study was to examine factors influencing the college choice decision of NCAA Division I volleyball student-athletes. **Methods:** A total of 235 NCAA Division I female student-athletes participated in the study. The participants represented 24 NCAA Division I conferences. A modified version of the Student-Athlete College Choice Profile Survey (SACCPs) was utilized to assess factors influencing the college choice decisions of NCAA Division I Volleyball student-athletes (Gabert, Hale, & Montalvo, 1999). An online survey software, QuestionPro.com, was used to collect data. Each of the 29 close-ended questions asked the participants to rank their choice on a five-point Likert scale ranging from 1[No Influence] to 5 [High Influence]. **Analysis:** Descriptive statistics (percentages, frequency distributions, means, ranges, and standard deviations) were utilized to describe the demographic characteristics of the participants. Means and standard deviations were utilized to compare factors influencing college choice decisions. **Results:** The top 5 most influential college choice factors for those surveyed were: athletic team atmosphere ($m=4.295$, $SD=.82$) followed by opportunity to compete ($m=4.111$, $SD=.899$), offer of athletic scholarship ($m=4.055$, $SD=1.433$), head coach/coaching staff ($m=3.983$, $SD=1.076$), and degree programs offered ($m=3.766$, $SD=1.14$).

Biography: Taylor is a graduate student in the Sport and Recreation Administration program. A former NCAA volleyball player, she graduated from Georgia College & State University in 2019. She has worked the past two years as the Graduate Assistant Volleyball Coach for the Jackrabbits. This past year she was selected as a recipient for the AVCA's Coaches 4 Coaches scholarship. In the future, she hopes to continue her career in collegiate athletics as a coach or an administrator. She would like to thank her family and Dr. Romsa for their support the past two years.

Project title: The Significance of a Successful Internship Program

Iverson, A.: South Dakota State University, Brookings, South Dakota

Presenter: Alexander Iverson

Advisor: Bryan Romsa

Objective: The goal for this internship was to develop and revamp the internship program for South Dakota States' Strength and Conditioning department in collaboration with one of the assistant strength and conditioning coaches. **Internship Design:** A 16-week long strength and conditioning internship curriculum to enhance the participants opportunity for growth and development as an intern within the South Dakota State University's strength and conditioning department. **Outcome:** Each week of the internship has an assigned topic and objective for a total of 16 topics that incorporate different aspects and knowledge of the strength and conditioning field to help the interns develop themselves both as a coach and as an



individual. Projects will be assigned periodically that will allow those partaking in the internship curriculum to experience numerous aspects of what a full-time strength and conditioning coach encounters on a weekly and or monthly basis.

Conclusion: Developing and implementing a successful internship program and curriculum was beneficial not only in the sense of providing the interns an environment where they could grow as both a coach and an individual, but also in the development of us coaches through teaching and educating these coaches of the future.

Biography: Alex Iverson is a second-year student in the Master of Science in Sport and Recreation Administration program at South Dakota State University. He completed his graduate internship requirements with the South Dakota State University's Strength and Conditioning department where he assisted in developing and revamping the department's internship program alongside the internship coordinator. Originally from Wonder Lake, Illinois, Alex is a strength and conditioning coach who looks forward to a career in collegiate strength and conditioning after graduation. He currently serves a graduate assistant strength and conditioning coach for the Jackrabbits and would like to thank Coach Nathan Moe, Coach Andre McIntyre, Dr. Bryan Romsa, Dr. Stella Liu and Jim Bies for their continued support and assistance in reaching his educational and professional goals.

Project title: Foundations of Publicly Subsidized Sport Stadiums: The Case of U.S. Bank Stadium

Jerome, T: South Dakota State University, Brookings, SD, South Dakota State University

Presenter: Tanner Jerome

Advisor: Hung-Ling (Stella) Liu

Objective: This study aims to address the common considerations concerning publicly subsidized sport stadiums. To provide an in-depth illustration into this process, a case study narrative of the Minnesota Vikings' journey to receiving a public subsidization totaling \$498 million for the construction of the U.S. Bank Stadium is presented. **Background and Framework:** As sports stadiums seemingly incorporate more luxurious amenities each year, it is not uncommon to now see the price tag for a professional stadium to surpass a billion dollars. Given this colossal cost, it has become difficult for private investments to finance the entire cost of a stadium. Therefore, combining the private financing of a professional sport stadium with a public subsidization has become a prominent, and debatably essential, practice. However, the process of acquiring public financial assistance is not straightforward, but rather an extremely scrutinized and complex process requiring appropriate economic and social justification. **Case Study Overview:** Prior to calling U.S. Bank Stadium home starting in 2016, the Vikings played at the Metrodome in downtown Minneapolis for over 30 years. Due to the Metrodome lacking many desirable features, the Vikings began seeking the construction of a new stadium that would position the team and Twin Cities of Minneapolis/St. Paul atop the NFL world. After undergoing a 15-year political dissension with the citizens of Minnesota and their legislature, the Vikings were finally granted their wish in 2012 with a commitment \$498 million in public subsidies to help pay for the \$1.1 billion U.S. Bank Stadium. **Conclusions:** The case of the Vikings and U.S. Bank Stadium depicts an in-depth examination into the foundations, justification, and business of financing a modern professional sport stadium. The material presented within the case study will help to educate readers and allow them to formulate informed opinions on this matter.

Biography: Tanner Jerome is now finishing his 6th year at South Dakota State University, as after he attained his bachelor's degree from SDSU in 2019, he decided to pursue his education a step further. The 2020-2021 academic semesters mark his final year as a graduate student in SDSU's Sport & Recreation Administration program. In his time at SDSU Tanner has been involved within the Athletic Department and served as the Graduate Assistant of Operations & Events at the Miller Wellness Center. Looking into his future, Tanner hopes to land a job in event management within either athletics or campus recreation.



Project title: Enhancing member experience during a pandemic

Presenter: Christian Gravius

Advisor: Hung-Ling (Stella) Liu

Objective: The goal for this internship was to create and implement a marketing plan for the Miller Wellness Center during its first semester open since the Covid-19 pandemic broke out. Keeping users safe while enhancing their experience and attracting more potential members was also a main goal of this project. In a time where the future of public spaces was and still is up in the air, keeping guests safe and as active members of the Miller Wellness Center was the aim. **Plan:** Design and implement creative marketing ideas, plans, programs and strategies to reach audiences during these uncertain times. Specifically, a strategic marketing program called “40 Days of Fitness” was created. The program implemented 40 different ways to stay fit through the Miller Wellness Center and included things like signage, newspaper ads, t-shirts, stickers, contests, and more to promote the Wellness Center’s 40th anniversary while keeping guests happy both at the facility and at home. Guests could engage in the program through social media ads, posts and by physically being in the facility. Along with the 40 Days of Fit celebration, guests were encouraged to sign in to the center 40 times between Sept. 7 and Nov. 15. Those who completed the challenge were awarded a special 40th anniversary Miller Wellness Center t-shirt. **Measurable Results:** Results for programs were measured by the number of participants and social media engagements. **Conclusion:** Implementing the strategic marketing plan used during 40 Days of Fit created new opportunities for guests to stay active, while also reminding them of the services and features of the facility that may go overlooked at times.

Biography: Christian Gravius is a second-year student in the Master’s of Science in Sport and Recreation Administration program at South Dakota State University. He completed his graduate internship requirements at the Miller Wellness Center where he created, designed and implemented a strategic marketing plan to increase membership while maintaining current members at the Wellness Center during the pandemic. Originally from Buffalo, New York, Gravius is a strategic communications professional who looks forward to a career in collegiate sports information after graduation. He currently serves as the sports information graduate assistant for the Jackrabbits.

Section 2: 9:40 AM – 10:50 AM M.S. Athletic Training & Nutrition and Exercise Sciences

Project title: The Risk of Depression in Football Players Diagnosed with a Concussion.

Jackman K, Roiger TC: South Dakota State University, Brookings, SD

Presenter: Kaitlyn Jackman

Advisor: Trevor Roiger

Context: Concussions remain prevalent among contact sport participants. Concerningly, evidence suggests that these traumatic brain injuries may lead to the development of psychological sequela, in particular depression. Most cases of elevated post-concussion depressive symptoms in current athletes are relatively transient, allowing the affected participant to safely return to normal activities. However, few studies have investigated the effect of concussion history on the development of depression among retired athletes later in life. **Objective:** To determine if elite American football players with a history of 1 or more concussions are at an increased risk of depression after sport retirement. **Data Sources:** PubMed and Google Scholar. Keywords: concussion, football, retired, NFL, collegiate, and depression. **Study Selection:** Studies that were level 2 or higher, published between 2006-2021, conducted on college or professional football players, and written in English were included. Studies that were conducted on non-football populations, focused on other neurological disorders, did not compare concussions and depression, and systematic reviews were excluded. **Extraction:** Three studies meeting the inclusion criteria were identified, analyzed, and rated according to the Centre for Evidence Based Medicine 2011 Level of Evidence Scale and Strength of Recommendation Taxonomy (SORT). Two level 2 studies and one level 4 study were appraised. **Data Synthesis:** All three studies from this critically appraised topic indicate that elite American football players with a history of concussion may be at an increased risk of developing depression or depressive symptoms after sport retirement. Two of the studies focused on retired professional football players while the third investigated depression among former collegiate athletes. **Conclusions:** Retired professional or collegiate football players with a history of concussion may develop



depression later in life. Future research should include larger samples, focus on concussions that occur earlier in an athlete's career, symptoms of depression that occur more frequently, and sport retirement.

Biography: Kaitlyn Jackman joined the South Dakota State athletic training staff as a graduate assistant during the Summer of 2019 and works with the softball, cheer, dance, and equestrian teams. Prior to SDSU, Kaitlyn graduated from the University of Kansas in May 2019 with a Bachelor of Science in athletic training. She is a certified and licensed athletic trainer. Kaitlyn is now working on her master's degree in Nutrition and Exercise Science with an emphasis on Exercise Science. Her future goals are to become an athletic trainer for a collegiate team at the Division 1 level and continue to help athletes.

Project title: Effectiveness of Color-Tinted Glasses in Reducing Photophobia in Patients Diagnosed with Mild Traumatic Brain Injury or Concussion

Ratermann S, Roiger TC: South Dakota State University, Brookings, SD

Presenter: Savannah Ratermann **Advisor:** Trevor Roiger

Context: Photophobia is one of the most commonly reported visual symptoms in individuals with mild traumatic brain injury (mTBI), with nearly fifty percent of individuals reporting photophobia. Current mitigation strategies include the use of sunglasses to provide relief from photophobia symptoms, but their use is not practical indoors or in areas with low light. Color-tinted glasses are growing in popularity as a functional alternative to sunglasses. **Objective:** To determine if color-tinted lenses reduce photophobic symptoms in patients diagnosed with concussion or mild traumatic brain injury. **Data Sources:** ProQuest, PubMed Central, ScienceDirect Publications, and Google Scholar were searched for articles. Keywords included concussion, mild traumatic brain injury, color-tinted glasses, computer gaming glasses, and photophobia. **Study Selection:** Studies that were Level 4 or higher, published in the past 10 years, included patients diagnosed with concussion or mTBI and experiencing photophobia, and incorporated color-tinted lenses as an intervention, were included. Studies not available in full-text online, did not measure photophobia, or focused on patients reporting post-concussion visual symptoms without photophobia, were excluded. **Extraction:** Four studies meeting the inclusion criteria (one Level 1, one Level 2, and two Level 4 studies) were identified and evaluated according to the Centre for Evidence Based Medicine 2011 Level of Evidence Scale and Strength of Recommendation Taxonomy (SORT). **Synthesis:** Color-tinted glasses may represent an effective supportive treatment for concussion patients who report photophobia. While each study reported improvements in self-reported photophobia after wearing color-tinted glasses, the evidence was limited by inconsistent methodologies and low numbers of participants. **Conclusions:** Color-tinted lenses should be considered as an intervention to lessen the effects of post-concussion photophobia. Further research should evaluate the effectiveness and functionality of color-tinted glasses and the use of other light-reducing strategies (sunglasses, hats, etc.) for the purpose of decreasing time to return to learn or return to play.

Biography: Savannah Ratermann is a second-year student in the MSAT program. She received a bachelor's degree in Exercise Science from South Dakota State University in 2019. While at SDSU, she has served on numerous executive committees for educational and cultural organizations, including serving as president for the Athletic Training Student Association. Savannah is interested in working with the high school athletic population.

Project title: Policies Surrounding Transgender Athletes and Participation in Competitive Sports

Gwyneth P, Zwart MB: South Dakota State University Brookings, SD

Presenter: Gwyneth Phillips **Advisor:** Mary Beth Zwart

Context: Recently, there has been an influx of laws surrounding transgender athletes and their ability to compete in sports according to their gender identification. Claims that transgender athletes hold a performance advantage over their



cisgender peers, has been the basis for current and past policies. **Objective:** What are the policies surrounding the participation of Transgender athletes in competitive sports and are these policies fair? **Data Sources:** A search was conducted using CINAHL, PubMed, Google Scholar, Ebsco and hand searching reference lists. Search terms included transgender athletes, policy, inclusion, fair and evidence based. **Study Selection:** Included studies reviewed policies surrounding transgender athletes in competitive sports published within the last five years. Studies were excluded if they did not address policies or if they required purchasing. **Data Extraction:** One systematic review and two commentary articles were identified and appraised. **Data Synthesis:** The systematic review of 31 policies concluded that there is limited research as to whether transgender athletes hold a performance advantage, and therefore, the policies unfairly exclude transgender people from competitive sport. Included in the commentary articles, the NCAA and IOC policy, Canadian Centre for Ethics in Sport guidelines and policies for young athletes were explored. One commentary concluded that transgender athlete inclusion in binary categories is unfair to cisgender competitors while the other concluded that the policies neither protect the integrity of women's sports, nor provide sufficient inclusion for transgender athletes. **Conclusions:** Due to the limited and inconsistent nature of the literature, there is little evidence to suggest that these policies are fair. Future research needs to involve high quality evidence on the basis of these policies and the inclusion of transgender athletes in sport. Strength of Recommendation: C. **Word Count:** 279

Biography: Gwyneth Phillips is a graduate student in the MSAT program. She got her BA in Health and Human Physiology and minored in American Sign Language at the University of Iowa before coming to SDSU. She is an avid runner, enjoys reading and listening to podcasts and loves coffee. She is looking forward to starting her Athletic Training career in Iowa.

Project title: Carbon Fiber Insole's Effect on Running Mechanics in Recreational Runners.

Rehder J, Zwart MB: South Dakota State University Brookings, SD

Presenter: Jenna Rehder

Advisor: Mary Beth Zwart

Context: After Eliud Kipchoge ran a sub 2-hour marathon wearing special Nike shoes with carbon fiber in the soles, questions surfaced if running in shoes with carbon fiber gives runners an advantage by improving their running economy? **Objective:** Will the addition of carbon fiber inserts change the running economy of recreation male runners? **Data Sources:** A search was conducted using Ebscohost, CINAHL, PubMed, and Google Scholar. Search terms included carbon fiber inserts, male runners, and running economy. **Study Selection:** Studies were included if they were level 2 evidence or higher, compared carbon fiber inserts to normal conditions in running, and were published in the last 10 years. Studies were excluded if they were not in English, did not have a control group or were level 3 evidence or lower. **Data Extraction:** Three randomized crossover studies were identified and appraised. **Data Synthesis:** Two studies compared carbon fiber insoles to a control condition. One study compared two different thicknesses of carbon fiber insoles to a control condition. All three studies assessed lower leg joint mechanics when running in the conditions on a treadmill. Results of all three studies show that there was a different in joint mechanics when running between the shoe conditions. **Conclusions:** Evidence suggests running in stiffer shoe conditions significantly alters the joint mechanics of the lower leg thus affecting running economy. One study found that the earlier onset of plantarflexion reduced the eccentric work of the muscles and the carbon fiber inserts returned energy to the runner. Cigoja et al found that locomotion was more efficient due to an increase of midsole bending stiffness and a decrease in mechanical work of the muscle tendon unit. Willwacher et al found that loading could be manipulated by different movement strategies and individual characteristics need to be considered.

Biography: Jenna Rehder is a student in the MS AT program from Hawarden, Iowa. She has a Bachelor of Science degree in Exercise Science from South Dakota State University. Her future career goals include being a certified athletic trainer for a division one college for baseball or softball.



Project title: Comprehensive Analysis of School Wellness Policy Toolkits

Hallenbeck, E, & Meendering JRI; -South Dakota State University Brookings, South Dakota

Presenter: Erin Hallenbeck

Advisor: Jessica Meendering

School wellness policy quality has improved since the federal requirement began during the 2006-2007 academic year. However, there is still a need to improve the quality of written school wellness policies and policy implementation. Additionally, districts and schools have expressed the need for resources to support school wellness efforts, despite there

being many national toolkits available for districts and schools. **Objective:** The purpose of this review paper is to present the school wellness toolkits currently available for policy writing and implementation and dissect the components of the toolkits to determine what is commonly and less commonly addressed. **Methods:** School wellness policy toolkits from federal agencies and nonprofit organizations that were created to serve a national audience were collected. Toolkits needed be a multifaceted resource providing guidance and resources for many levels of the school wellness process in order to be included. The search excluded model policies and templates that were limited to how to write a wellness policy. **Results:** Eight resources met the inclusion criteria. One toolkit targeted wellness efforts at the school level, six had resources for both the district and school levels, and one had resources for the district level only. Commonly addressed items in the toolkits included communication and marketing materials to gain community support and resources for committee structures, policy writing, implementation, assessment. Less commonly addressed components included grant and funding opportunities and training for school wellness staff. **Conclusions:** There is a need for toolkits to be more comprehensive in their instructions for the differing roles of the district and the school, to include detail on what is required in a written policy and how schools should best implement the policy. Furthermore, the development of a single gold standard resource covering all steps of the school wellness process is warranted to simplify the process for districts and schools and improve consistency nationwide.

Biography: Erin Hallenbeck is a graduate student pursuing a M.S. in Nutrition and Exercise Science, specializing in Exercise Science. She is also pursuing a graduate certificate in Transdisciplinary Obesity Prevention. While in graduate school, Erin was a graduate teaching assistant in the Department of Health and Nutritional Sciences and taught many PE 100 fitness classes and assisted with courses within the exercise science major. She plans to pursue a career in the fitness industry after graduation. Erin would like to thank her advisor, Jessica Meendering, for her guidance throughout her time at SDSU and always pushing her to best, and also to her classmates and fellow GTAs for all of their support.

Project title: Fasting for Weight Loss

Ammons, LT: South Dakota State University, Brookings, SD

Presenter: Logan Ammons

Advisor: Lee Weidauer

Context: The effect of overweight and obesity in the United States and the world has become a major problem and has progressed very quickly in the last two decades alone. **Design:** Literature Review **Literature Summary:** A sedentary lifestyle and abundance of certain food choices, mainly refined carbohydrates, have made gaining excess fat all too easy. This excess fat mass can have a drastic effect on the health of the human body, causing an increased risk for chronic disease. A constant flow of high carbohydrate diet can lead to an increase in circulating hormones. The main hormone of interest is Insulin. Constant abundance of circulating insulin can lead to insulin resistance and subsequent type 2 diabetes. Correcting the overweight and obesity epidemic is a multi-factorial problem, one of these problems focuses on intake. A caloric deficit is needed to facilitate the loss of adipose tissue. There are many ways to achieve a caloric deficit, my focus will be centered around fasting as a tool to create and sustain a caloric deficit. Fasting can come in many forms and durations, ranging from short term fasts like intermittent fasting, and lasting as long as weeks at a time. The benefits of fasting include saving of muscle protein, and the salvaging of the Basal Metabolic Rate which can drop significantly during a crash diet or weight cut.



Fasting has proven itself to be a useful tool in a medical setting and has merit as a tool for athletes as well. **Conclusion:** Fasting has been shown to be an effective method for decreasing insulin secretion and increasing fat utilization. Because of this, a benefit may exist for athletes.

Biography: Logan Ammons is from Kadoka South Dakota and earned a bachelor's degree from SDSU, in Sport and Recreation Management. He is currently a Graduate Assistant for SDSU Strength and Conditioning, designing and implementing programs for the softball and men's and women's swim and dive teams while pursuing a master's degree in Nutrition and Exercise Science. After graduation, Logan will be moving to Phoenix, Arizona to work as a strength and conditioning professional at Weights and Plates, a Starting Strength Affiliate.

Project title: Lactate Supplementation on Exercise Performance

Astleford R.: South Dakota State University, Brookings, South Dakota

Presenter: Rachel Astleford

Advisor: Matt Vukovich

Objective: The goal of this review is to provide information on the evolution of lactate supplementation research and how it may influence metabolism and athletic performance. **Methods:** Papers used in this review were primarily found in PubMed. Papers that explained the history of lactate and lactic acid research, glycolytic pathway, lactate's functions, and its role in exercise performance were used. Studies utilized in this review used both untrained and trained adults as participants. **Results:** Studies that focused on steady state exercise did not see a significant increase in performance when combined with lactate supplementation, but studies that utilized high intensity performance saw a positive response and increased time to exhaustion with lactate supplementation. **Implications:** Consistent endurance training can result in a higher lactate threshold. Lactate supplementation may provide an additional performance benefit during training and competition

Biography: Rachel Astleford is a graduate student studying Nutrition and Exercise Science and will graduate with a master's degree in May 2021. She received her undergraduate degree in Nutrition and Dietetics from South Dakota State University in 2019. Whilst completing her master's degree, she has also finished the dietetic internship program through SDSU and is looking forward to her future career as a registered dietitian.

Section 3: 11:00 AM – 12:00 AM M.S. Nutrition and Exercise Sciences

Project title: Dietitian Involvement in Protein Recommendation Research for Athletes

Hoffman,F, Dey,M: South Dakota State University, Brookings, South Dakota

Presenter: Francine Hoffman

Advisor: Moul Dey

Abstract: Objective/Background: The aim of this study was to discuss the current knowledge and practice regarding the optimal levels of protein intake for athletes, and also to highlight the importance of a dietitian's involvement in nutrition science research. **Study Design/Methods:** A peer-reviewed PubMed literature search reviewed 43 papers for protein intake. Another PubMed search reviewed 61 papers to determine the educational background/affiliations of authors specific to gut microbiome research. A survey was sent to universities across the country to determine Academic Dietitian involvement in microbiome research; 45 of 114 universities provided completed responses. **Analysis:** Protein's effect on the kidneys, gut microbiome, and osteoporosis was determined with a literature review on PubMed. Dietitian involvement in research was determined by a literature review and doing in-depth analysis of authors/affiliations involved in papers. Of the survey conducted, data collected was analyzed to determine the percent of academic dietitians involved in microbiome research. **Results:** Survey: 11% of all tenured faculty were involved in microbiome research in the past 7 years; 8% tenured faculty were principal investigator in research relating the gut microbiome to diet; 5% of tenured faculty that have engaged in microbiome research in the past 7 years had research funded by the NIH. Literature Review determining the corresponding author for microbiome research: 8% were RDs, 19% had MS/PhD in Nutrition field, 29% were Medical Doctors, 44% were other/unknown. **Conclusions:** Dietitians need to be more involved in diet-related research. Several factors could contribute to RDs not being involved. High protein intake is not proven to cause kidney damage unless CKD is



present. Insufficient evidence is available to determine if high protein intake negatively affects the gut microbiome. High protein intake is not proven to cause osteoporosis.

Biography: Francine completed her bachelor's in Nutrition & Dietetics at SDSU and is a graduate student in the Nutrition and Exercise Science Program. Francine is advised under Dr. Moul Dey and was able to combine her interest of sports nutrition and the microbiome for her research project. Francine did research for Dr. Dey to gather data to advocate for improving microbiome education into nutrition curriculums. Francine has just completed her Dietetic Internship and is interested in clinical dietetics, education, or sports nutrition. Francine has her NSCA-CPT and CSCS credentials and would like to incorporate training into her career.

Project title: Project title: Supplementation of Omega-3 Polyunsaturated Fatty Acids Improves Recovery and Exercise Performance in Healthy Adults.

Folley, R, Droke, E: South Dakota State University Brookings, South Dakota

Presenter: Ryan Folley **Advisor:** Elizabeth Droke

Objective: The aim of this study is to evaluate the effects of omega-3 polyunsaturated fatty acid supplementation on performance and recovery of healthy adults. **Study Design:** A narrative review was performed by conducting a literature search of randomized controlled trials involving supplementation of the predominant omega-3 fatty acids, Eicosapentaenoic acid (EPA) & Docosahexaenoic Acid (DHA), in healthy adults prior to or during exercise training protocols. **Measureable Outcome/Analysis:** Randomized control trials that included measures of inflammatory biomarkers including interleukin-6 (IL-6), myoglobin (mb), creatine kinase (CK), and Tumor-necrosis factor-A (TNF- α). Additionally, muscle strength, perceived feeling of muscle soreness and stiffness, and range of motion (ROM) were assessed following endurance or resistance exercise protocols. **Conclusions:** Supplementation of omega-3 fatty acids observed a significant reduction in inflammatory biomarkers that are commonly associated with exercise induced muscle damage (EIMD). Additionally, assessments of ROM, muscle strength, and perceived feeling of soreness all improved with supplementation of omega-3's. This suggests that athletes of various levels participating among different sports could see improvement in recovery and performance with supplementation of omega-3's.

Biography: Ryan is a graduate student in the nutrition and exercise science program with a specialization in nutrition. His future career goals are to work as a registered dietitian in a sport or military setting to help these individuals improve their performance through nutrition. Ryan would like to thank his advisor, Dr. Droke for the support and guidance through the graduate program over the past two years.

Project title: A Narrative Review of Grocery Store Interventions on Improving Healthy Food Purchases

Serie K, Stluka S, Kattelman K: South Dakota State University Brookings, South Dakota

Presenter: Kylie Serie **Advisor:** Kendra Kattelman

Objective: The objective of the literature review was to understand and review current research in the area of grocery store interventions to improve purchasing of healthy foods. **Methods:** PubMed and web-based searches were done for original research literature that looked at supermarket and grocery store interventions promoting healthy food choices. The literature could include qualitative and quantitative data. Keywords that were used include: "grocery store," "interventions," "healthy eating," "supermarket," "healthy foods," "store intervention," "food retail intervention," "convenience store." **Results:** The review showed that there are studies on supermarket interventions. Interventions that showed positive outcomes were those that had direct customer benefit, participation, and engagement. These interventions included nutrition education programs that reported improvement in overall diet quality as well as customer satisfaction, a nutrition label education program that had high levels of satisfaction and positive changes in confidence and knowledge regarding nutrition labels, a coupon program that lead to an increase in healthy food purchased, and an



evaluation of marketing techniques such as placement, promotion, and pricing of products which did indicate its influence in customer purchases. **Conclusions:** Many different factors can influence the impact of grocery store interventions. These factors include the location and financial position of the grocery store, the products they choose to purchase, how they choose to display the products, slotting fees, and any promotions they get from distributors. The interventions are also impacted by the customer's readiness and willingness to make behavior change for nutrition education interventions. Evidence suggests that certain interventions have been shown to improve the healthfulness of purchases for customers as well as increase their knowledge of healthfulness.

Biography: Kylie is a dietetic intern and student in the Nutrition and Exercise Science program. She graduated from SDSU in 2019, receiving a B.S. in Nutrition and Dietetics. During her time at SDSU, she worked on an initiative, Stock Healthy Shop Healthy, through Extension. The initiative worked to help increase the amount of healthy food "shelf space" for grocery stores in rural communities. Her experience with Stock Healthy Shop Healthy sparked her interest in additional research on grocery store interventions. In the future, Kylie plans to further her studies in functional and integrative nutrition.

Project title: The relationship between American Indian's socioeconomic status, diet, & gut microbiome: a preliminary research study

Christianson J, Kattelman K, Scaria J, Kolady D, Adams S: South Dakota State University Brookings, South Dakota

Presenter: Jenna Christianson **Advisor:** Kendra Kattelman

Objective: The objective of this study was to analyze the relationship between socioeconomic status and dietary habits of those who self-report as American Indian and to determine whether this has an impact on digestive health measured using microbiome diversity in stool samples. **Study Design, Setting and Participants, and Intervention:** A cross-sectional sample of participants (n = 50; n = 35 women, n = 15 men) were recruited at a Great Plains Area Indian Health Services Health Care Center, were invited and then provided consent to participate in the study completing a socio-economic questionnaire, one 24-hour dietary recall, and stool collection kit. **Measurable Outcome/Analysis:** Stool kits were analyzed for microbial composition and microbial communities using NanoDrop™, Qubit Fluorometer 3.0, and Quantitative Insights into Microbial Ecology framework. Dietary data was analyzed using Automated Self-Administered 24-Hour Recall Dietary Assessment to determine participant's Healthy Eating Index (HEI) nutrient, food group, and total scores. Correlation analysis were used to analyze the relationships between microbial composition, microbial communities, HEI, and selected socioeconomic and health variables. **Results:** No correlations were found to be statistically significant between microbiome diversity, HEI, and selected socioeconomic and health factors. However, having a high average income and following a traditional diet were found to be positively correlated to having a high HEI. **Conclusions:** The socioeconomic status and dietary habits of American Indians showed no significant impact on digestive health measured using microbiome diversity in stool samples. These results are limited based on a limited sample size and recruitment in one American Indian tribe which might not represent the diversity of all American Indian populations. In addition, the study lacked dietary variability due to only one 24-hour dietary recall being collected per participant. Future research is implicated to better understand the relationship between socioeconomic status, dietary habits, and digestive health in American Indian populations.

Biography: Jenna Christianson is a current dietetics student and intern in the combined Masters of Nutrition & Exercises Sciences and Dietetic Program. She also completed her undergraduate degree in Nutrition & Dietetics at SDSU. Her area of interest in the field of dietetics is women's health. She currently works for a private practice integrative and functional dietitian and will continue to do so after completing her Masters.



Project title: Role of Omega-3 Fatty Acids on Pregnancy, Fetal, and Infant Development

Strait H; South Dakota State University Brookings, South Dakota

Presenter: Haley Strait **Advisor:** Kendra Kattelman

Objective: The aim of this review paper is to demonstrate the impacts of omega-3 fatty acids in maternal health, fetal and infant development, identify dietary sources of docosahexaenoic acid (DHA), eicosapentaenoic acid (EPA), and alpha-linoleic acid (ALA), and provide recommendations for intake. **Study Design, Participants, and Intervention:** A narrative review of omega-3 fatty acids in maternal health, fetal and infant development. **Results:** Studies suggest that a deficiency in ALA decreases DHA content in the brain by 20-22%. Experts from various scientific groups recommend a dietary goal of 650 mg/day, or 1.4 g/day during pregnancy and 1.3g/day during lactation. DHA makes up 10-20% of fatty acid composition in the brain. DHA deficiency in mothers can lead to various mental problems during and after their pregnancy. **Conclusion:** Most pregnant women do not consume an adequate amount of omega-3 fatty acids, along with the recommended serving size of only 2 servings per week. This is often due to caution regarding consumption of methylmercury, which is a neurotoxin found in seafood and fish. The fetus is dependent on the mother and placenta for adequate DHA amounts to be transferred. Therefore, adequate maternal dietary intake of omega-3's is essential for various reasons. Research has demonstrated that omega-3 fatty acids not only influence learning disorders, visual acuity, mental and psychomotor skills, and fetal cognition, but also postpartum depression, preterm birth, and length of gestation.

Biography: Haley Strait is a dietetics student from South Dakota State University. She graduated with a Bachelor's degree in Dietetics and Nutrition from South Dakota State University in 2019. Haley is currently pursuing a Master's degree in Nutrition and Exercise Science and will graduate in May of 2021. After graduation, she will continue her passion of nutrition as a dietitian for MercyOne Siouxland Medical Center in Sioux City, Iowa. At MercyOne, Haley will be a medical inpatient dietitian and an outpatient diabetes educator.

Project title: The relationship of blood serum levels of vitamin B6, folate, and vitamin B12 on depressive symptoms in adults aged 18-65.

Presenter: Kelsey Kessler **Advisor:** Elizabeth Droke

Objective: The aim of this literature review is to assess the relationship between the B vitamins: B6, folate, and B12 and depression in adults. **Method:** The author conducted the search of the Internet database PubMed using key words such as: depression, mood, vitamin B12, vitamin B6, folate, homocysteine. The search included articles from 2003-2020. The search was limited to ages 18-65. **Results:** Serum levels of three B vitamins, vitamin B6, folate, and vitamin B12, are negatively correlated with depressive symptoms. These vitamins act as coenzymes in the methylation process of DNA, proteins, and lipids. In the methylation and transsulfuration processes, vitamin B6, folate, and vitamin B12 metabolize homocysteine into methionine and cysteine respectively. Methionine later goes on to be converted to S-adenosyl-methionine (SAME). SAME is a methyl donor to neurotransmitters such as serotonin, gamma-aminobutyric acid (GABA), dopamine, and norepinephrine which are critical for mental health. Serum blood levels of the three B vitamins are negatively correlated with homocysteine levels, neurotransmitter levels, and depressive symptoms. Elevated levels of homocysteine are believed to contribute to osteoporosis, heart disease, dementia, and Alzheimer's disease. **Conclusions:** The literature review shows promising evidence of serum blood vitamin B levels negatively correlating with depressive symptoms. Additional research is needed to be conducted in order to determine the connection of depression to one, two, or all three of the B vitamins discussed.

Biography: Kelsey is a student in the Dietetic Internship program and is completing her Master's Degree in Nutrition and Exercise Sciences. Her goals include taking and passing Commission on Dietetic Registration Exam as well as getting a full-time clinical dietitian position.