

Trace elements exposure and gut microbiome of the residents of agricultural and fishing communities in Japan.

日本の農村・漁村地域住民の微量元素曝露と腸内細菌叢

Hiroaki Naka 那賀 裕朗

Department of Human Ecology, School of International Health, The University of Tokyo

Introduction

The human gastrointestinal tract hosts a diverse community of bacteria known as the gut microbiome, essential for human metabolism. While various factors may influence the diversity and composition of the gut microbiome, the association between trace element exposure and the gut microbiome is not clear. This study explored the association between urinary concentrations of various trace elements and the gut microbiome in residents from two regions in Japan.

Method

This study was conducted in July and August 2022. A total of 261 adults from Ojika in Nagasaki and Suzu in Ishikawa provided both fecal and urine samples. Urinary concentrations of trace elements (Cr, Mn, Co, Cu, Zn, As, Se, Mo, Cd, Sn, and Sb) were measured using ICP-MS. The fecal DNA was assessed by 16S rRNA analysis. I examined the association of urinary trace element concentrations with gut microbiome diversity by multiple linear regression analysis and with community structure by PERMANOVA. Additionally, I examined the association between urinary concentrations of trace elements and bacterial composition at both the phylum and genus levels by multiple linear regression analysis.

Results

There were no associations between gut microbiome diversity and urinary concentrations of trace elements. Gut microbiota community structure was associated with urinary concentrations of copper (unweighted UniFrac distance PERMANOVA), manganese, and arsenic (weighted UniFrac distance PERMANOVA). Multiple linear regression analysis identified significant associations between urinary trace element concentrations and bacterial composition at both the phylum and genus levels.

Conclusion

The study findings imply that trace element exposures were associated with gut microbiome community structure.

Health issues caused by living in a hilly area with limited road access

車道のない斜面地に高齢者が居住することによる健康問題

Tatsuya Aiko 愛甲 達也

Department of Human Ecology, School of International Health, The University of Tokyo

Introduction

For older people with reduced physical ability, slopes are expected to cause a rapid decrease in physical activity and weight gain, as well as difficulties in various aspects of daily life, such as shopping, when with limited road access. This study estimated the total population and older population living on slopes with limited road access in Japan, and verified whether the proportion of older people and other factors are high in such areas.

Methods

After combining several datasets, the distance from all buildings to the nearest road (at least 3 m wide) was measured, and the proportion of buildings with a distance of 10m or more to the nearest road (hereafter referred to as "roadway distance ratio") was calculated for each mesh with an average slope of 15 degrees or higher. This was multiplied by the total population and older population in each mesh to estimate the total population and older population living on slopes with limited road access. A Two-way ANOVA was conducted using the mean slope and roadway distance ratio as independent variables, and the proportion of older people, proportion of households with a member aged 65 or older, and proportion of households with a single older person or older couple as dependent variables. Meshes with less than 2 households, less than 6 total population, and less than 3 buildings were excluded.

Results

The total population estimated to live in buildings with slopes of 15 degrees or more and 10 meters or more from the roadway was 730,000 (0.6% of the total population), and the older population was 312,000 (0.9% of the total older population). All dependent variables were significantly higher in meshes with an average slope of 15 degrees or more and a roadway distance ratio of 50% or more, compared to meshes with less slope and a roadway distance ratio of less than 50%.

I will also present what I learned during a 3-week fieldwork in Nagasaki.

Why do ethnic minorities in northern Laos like bitter and sour foods?: An approach from taste perception and eating motivation

**ラオス北部の少数民族はなぜ辛い・酸っぱい食べ物が好きなのか？
—味覚と食選択の動機についての探索的研究—**

Mihoko Kibe 木部 未帆子

Department of Human Ecology, School of International Health, The University of Tokyo

Introduction

Bitter and sour tastes are signals of toxins, and unripe or spoiled food, respectively. Our innate aversion to strong bitter and sour tastes has played an important role in human survival. In northern Laos, however, an “extraordinary” preference for bitter and sour foods has been observed. In mountain villages, locals have enjoyed eating even some poisonous or medicinal plants in the Japanese classification. This study examined the phenomenon in a physiological term: we hypothesized that the people in northern Laos prefer to eat bitter and sour foods because they do not strongly feel the bitter and sour tastes (or they have higher perception thresholds of bitter and sour tastes). The presentation will also report the qualitative results of the interview on eating motivation.

Methods

The data was collected from 142 individuals from Nam Nyon (n = 96) and Phia Mai Noy (n = 46) villages, Oudomxay Province, in January-March 2023. Taste perception was examined using the Waterless Empirical Taste Test (WETT[®]; Sensonics International, US). The interview survey was conducted in Nam Nyon based on the questionnaire of The Eating Motivation Survey (TEMS; Renner et al., 2012).

Results and Discussion

The WETT[®] suggested that perception thresholds of salty, bitter, and umami tastes were higher in the study population, probably because of the large consumption of salt and umami condiments and tobacco use. The ordinal logit regression analysis showed that eating frequencies of bitter and sour foods were not significantly associated with taste perception after adjusting for village, sex, age, body mass index, and smoking status; instead, it was strongly associated with village entered into the model as a covariate. The interview survey suggested that people in Nam Nyon placed a higher importance on habit, convenience, and natural concerns as eating motivations. Further investigations considering village-specific factors such as food habits and land use will improve our understanding of bitter and sour food preferences and their possible contributions to the survival and health of locals in northern Laos.

Marketing Research in the Food and Consumer Goods Company: At Dining Tables From Rural Thailand to Japan

食品・消費財企業におけるリサーチ：タイ農村部から日本の食卓へ

Shun Iwakami 岩上 俊
Ajinomoto Co., Inc.

In the context of Japanese food and consumer goods company, various types of "research" are conducted, differing in meaning and methodology from the academic sphere. Among these, marketing research (market research) stands out alongside clinical research through industry-government-academia collaboration and research and development of products. Marketing research is defined as "activities by organizations such as companies to understand customers, create tailored products and services, and efficiently utilize various management resources"(JMRA). This involves understanding consumer thoughts and behaviors through directly asking by surveys or interviews.

Compared to academic research, there are many differences in terms of the way questions are developed and the robustness of validation, as the focus is on discovering business opportunities and aiding decision-making. However, there are several aspects that now I can apply to my work from what I had learned during my study in the department.

The first point is the importance of a holistic perspective that attempts to view the entirety of consumers' lives. Understanding the relationship between consumers and food, which appears daily in their lives, requires more than just grasping the moments they use or eat the product. It sometimes necessitates understanding what kind of job the person does, how they spend their day, and even how they were raised in the past.

The second point is the difficulty and importance of developing (research) questions while exploring what is considered normal for oneself and different cultures. Consumers' behaviors are not always immediately understandable, but unraveling them reveals their own logic. Conversely, what manufacturers consider normal can be disrupted when learning about consumers, leading to hints for new ideas.

Finally, and most importantly, related to the above two points, is placing oneself in the field as close to consumers as possible. Rather than having 10,000 consumers respond to a survey, visiting one household to observe how they actually prepare food provides a deeper understanding of the consumer.

Acquiring such a framework and attitude through experience has become a significant strength in my current work, although it was initially unforeseen.

Mineral and Energy Resource Development in Papua New Guinea and Issues Surrounding It

パプアニューギニアの鉱物エネルギー資源開発とそれをめぐる諸問題

Kiyoshi Tadokoro 田所 聖志
Faculty of Sociology, Toyo University

Introduction

Large-scale resource development has an impact on both the socio-economic and environmental aspects of the development areas, and changes the social situation in these areas. However, the way in which these changes are understood varies across cultures and societies. In this presentation, based mainly on my fieldwork in 2015 and 2016, I will present the case study of the Huli people in Papua New Guinea, whose area has been affected by large-scale natural gas development. How do the Huli people understand the changes in their social situation as a result of this project?

Subjects and Methods

The natural gas development project in the Huli area, known as PNG LNG, started in 2008. The natural gas produced will be processed into liquefied natural gas (LNG) and exported to China, Taiwan, and Japan. According to the previous studies, the people of Huli were extremely frustrated by the lack of distribution of the benefits of resource development. As a result, a chaotic situation has developed in the area, including a deterioration in security. The analysis in this presentation uses data up to 2017, as the deteriorating security since 2018 has made it difficult to conduct field research. The research methodology I used consisted of interviews and a food survey.

Interim Findings and Discussion

Based on the fieldwork, I found changes in bridewealth and the places of origin of spouses, as well as changes in diet. These results clearly show that the social environment in which the Huli live has changed as a result of the project. In addition, narratives about climate change were also collected. The various statements may indicate that they understand these changes in ways that draw on their pre-existing local beliefs. For example, they feel natural gas is oil in the ground, which is a source of nutrients for plants. The climate, from their point of view, is becoming dry because the exploitation of natural gas is taking the nutrients out of their land. Moreover, it became clear that while the registered land groups, recipients of a percentage of the profits, are created on the basis of state law, they feel the law's definition of land groups differs from their conception of the land groups. The findings remind us of Banks's indication (2013): Because resource development is "capital-driven and rooted in formal Western knowledge-based notions of development that may not be shared by Pacific Islanders," there is a dilemma that is difficult to resolve. At the very least, and for the moment, it would confirm the importance of paying attention to local conceptions.

Research on outdoor play: why children are more energetic when they play.

外遊びを研究する！

Mari Yoshinaga 吉永 真理

Showa Pharmaceutical University, Laboratory of Clinical-Community Psychology

Introduction

I have been involved in research on children's play environments since around 2004. We started by creating playground maps of four generations (great-grandparents, grandparents, parents and children) to visualise changes in the play environment. Since then, we have conducted research on the relationship between young children's acquisition of empathy and behavioural control and outdoor play, a programme of cooperation between young children and elementary schools using playgrounds, outdoor play and child development, research on children's after-school places, and research on the safety and security of access to playgrounds. I will talk briefly about 'outdoor play and child development'.

Subjects and Methods

We conducted a questionnaire survey (n=1012) at four elementary schools in the Kinuta area of Setagaya Ward, which is rich in green (trees and grassland) and blue (waterfront) areas, and GPS recording of play behavior trajectories, activity and step counts with activity meters, and measurement with a two-dimensional mood scale for 15 elementary school students in the same area.

Results and Discussion

Time spent in physical play, playing in a green environment (trees and grass), playing in a blue environment (near a river, stream or pond) and playing games were associated with SDQ scores for emotion, peer relationships, prosociality and hyperactivity, respectively, while time spent in physical play was associated with DSM-5 attention deficit scores. Play practices and measurements showed that children were most active during the last 30 minutes of play, and when children were divided into two groups based on the amount of activity during this time, the active group showed significantly higher arousal on the mood scale at the beginning and end of the activity.

Conclusion

Mental and physical health is enhanced when children are allowed to play freely and actively enough to be fully satisfied.