

MULTILAYER MINERAL COMPOSITION OF SNACKS FOR SERIAL ENTREPRENEURSHIP

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ABSTRACT

The study investigated the multilayer mineral composition of the snacks for serial entrepreneurship been produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas. The organoleptic/sensory evaluation was carried out on the samples. A nine-point Hedonic scale and Analysis of variance (ANOVA) was used. The simple random sampling technique was used to select a sample size of 15 serial entrepreneurship ventures in Imo State University, Owerri as judges. A comparative statistics and comparative analysis was conducted to present the difference in proximate composition (moisture, crude protein, crude fiber, crude fat, total ash, total carbohydrate and gross energy values), mineral contents (Ca, K, Na, Mg, Mn, Cu, Fe Zn and P) and anti-nutritional factors (phytate and tannin) in the samples (PTC 1, SPC 2 and NBC 3). The analyses were performed using SPSS version 25 (19). Differences in means at $p < 0.05$ were considered significant. The formulated hypotheses were analyzed using ANOVA. Any significant level less than 0.05 was significant and accepted. But any significant level more than 0.05 was not significant and therefore rejected the null. Some of the findings are that the proximate compositions of serial entrepreneurs (moisture, protein, crude fiber, crude fat, ash, carbohydrate and gross energy values) of the samples were normal. Hence, the contribution to scholarship are Serial entrepreneur needs nutrient-dense diet. The moisture content ranged between 25.97% and 20.85% with 20.85 (SPC 2) the lowest moisture content.

KEYWORDS: *Pumpkin, Sweet Potatoes, Dates, Tiger Nuts, Native Bananas, Serial Entrepreneurship, Innovation, Creativity*

Introduction

Business is energetic, every entrepreneur need good food and nutritious diet to cope and withstand the stress, dynamic, reckless, troublesome and competitive nature of business. Serial entrepreneurs is among the business men that faces most of these bottlenecks and pitfalls. Serial entrepreneurs needs nutrient-dense diet.

A serial entrepreneur is an individual who starts, manages, and (ideally) sells multiple businesses or ventures throughout their career. Unlike traditional entrepreneurs who focus on growing a single company, serial entrepreneurs thrive on the process of creation and innovation. Their entrepreneurial ventures often span diverse industries (Ovharhe, Woko and Uche (2021). Using the approach of therapeutic entrepreneurship, Ovharhe (2022) believe that entrepreneurs need therapeutic diet to build balance against injelitis, bitterness, stress, depression and cynicism. To gain motion on serial entrepreneurship. Furthermore, Ovharhe (2022a); Ovharhe & Chukwuemeka (2023) focus on gaining mental balance in wellness, livelihood, and wellbeing in the business pursuit in serial entrepreneurship.

Serial entrepreneurs often possess a knack for identifying new opportunities, an appetite for calculated risks, and the ability to scale businesses before selling them or passing the leadership torch. Serial entrepreneurs need good and quality diet to gain momentum on the business competition (Almeida, 2025)

For most serial entrepreneurs, success comes from clearly identifying a target market and building a business that meets that market's needs or fills a gap in the market. But they don't stop there. Serial entrepreneurs learn valuable lessons from their first business and apply those lessons to future endeavors. Here are four serial entrepreneurs with ecommerce expertise who may inspire your own forays into business

Ovharhe (2025d) said money is therapy. Therapeutic money is a byproduct of the value that you create nad innovate. In the chronicles of entrepreneurship world, new startup, focus on how your product or service will improve the lives of your clients. If your idea resonates and you manage your business well, the money will flow. The most successful ventures are those that truly serve the needs of a market and aren't just designed to make a quick buck.

A serial entrepreneur is an individual who starts, manages, and (ideally) sells multiple businesses or ventures throughout their career. They need credible nutrient to boost their energy and strength to face the merchandizing business and entrepreneurial parity. Business is reckless, dynamic, troublesome and competitive entity that needs energy, wellbeing and wellness from nutrient-dense diet to sustain and survive.

Maintaining a nutrient-dense diet is critically important for older adults because of the impact of food intake on health (Andres & Aylin, 2025). Years of research have demonstrated that diet quality has a huge effect on physical condition, cognitive condition, bone health, eye health, vascular function, and the immune system (Wayne, 2025). Yet, this can be challenging to achieve for several reasons. As pointed out by Davies (Gregor, 2008), aging is often accompanied by a loss of appetite and changes in taste and smell, all of which can lead to more limited food choices and lower intake of healthful foods. Aging is also often accompanied by general oral health decline and a reduced ability to swallow (Herro, 2006), which can affect food choice and intake. Many older adults experience mobility constraints, which make it difficult to shop for food, lift heavy jars, open containers, etc. As both Wellman and Kinsella (2006) mentioned, low income is prevalent in aging populations, making it difficult for many older adults to access high quality

foods (i.e., because those foods tend to be more expensive). Though, for easy accessibility of healthful foods, geriatrics should engulf with socio-economics entrepreneurial functions (Ovharhe, 2024a,b).

Because of the changing dietary needs of older adults, the adult nutrition aid was developed and termed the Modified Food Pyramid for older adults (Russell, 2009). The pyramid indicates the need for calcium, vitamin D, and vitamin B₁₂ supplements because many older adults do not get enough of these nutrients in a standard diet. As a result of this, nutritionists have suggested the development of recipes for solving some of nutrition problems of the elderly. These recipes should contain adequate nutrients which will provide the major nutritional requirements of this population for sustainable health. Researches (Belasco, 2002; Darnhofer, 2005) have indicated that pumpkin flute, orange potatoes, dates, tiger nuts, native bananas possess essential nutrients which can be vital for the promotion of sustainable health amongst the aging population. In the African settings, entrepreneurship functions must be inclusive to aged people to brighten their nutrition lifestyle to strengthen their income level (Ovharhe, 2025).

Pumpkin (*Telfairia occidentalis*) is a tropical vine grown in West Africa as a leaf vegetable and for its edible seeds. Common names for the plant include fluted gourd, pumpkin, anyu (in the Igbo language), and ikong-ubong (in the Efik and Ibibio languages). Considered an "oil seed", the fluted gourd is high in oil (30%) (Gregor, 2008). Shoots of Pumpkin flute contain high levels of potassium and iron, while seeds are composed of 27% crude proteins and 53% fats (Mert, 2015). The leaves contain a high amount of antioxidants and hepatoprotective and antimicrobial properties. The leaves contain a high amount of antioxidants and hepatoprotective and antimicrobial properties. The pumpkin flute has a range of fantastic health benefits, including being one of the best-known sources of beta-carotene (Herro, 2006). For example, beta-carotene is a powerful antioxidant. It also gives orange vegetables and fruits their vibrant color. The body converts any ingested beta-carotene into vitamin A. Consuming foods rich in beta-carotene are good for older people as it has been revealed that it may reduce the risk of developing certain types of cancer (Chuku, 2004), offer protection against asthma and heart disease (Alaribe, 2008), and delay aging and body degeneration (Butler, 2007). Many studies have suggested that eating more plant foods such as pumpkin decreases the risk of obesity and overall mortality (Harry, 2008; Ahmed & Rufai, 2017). It can also help prevent diabetes and heart disease, and promote a healthy complexion and hair, increased energy, and a healthful body mass index (BMI) (Agbaire, 2011).

Sweet potatoes have been found to be ideal foods for the elderly with rich nutrient contents. Orange Potato has enormous health benefits including its ability to help gain weight and boost immunity (Tellstrom, Gustafsson & Mossberg, 2005). It also helps ease digestion, in treating bronchitis, arthritis and stomach ulcers. Like other sweet potatoes, orange potato is high in fibre and has a good taste. There is also the presence of magnesium in it. These properties combined improves digestion a great deal. They are easy to digest since they are mainly starch. This foodstuff is rich in beta-carotene. Beta-carotene is a major antioxidant and together with phosphorus, iron, Vitamin C and Vitamin B complex and iron (Lehmann, 2003). They are a very

good immune booster, preventing your body from a variety of ill conditions, and also are important in managing arthritis (Mert, 2015).

More so, dates are the fruit of the date palm tree, which is grown in many tropical regions of the world. Dates have become quite popular in recent years. Dates have an excellent nutrition profile. Since they are dried, their calorie content is higher than most fresh fruit. The calorie content of dates is similar to that of other dried fruits, such as raisins and figs (Baba, 2015). Despite their calories, dates contain some important vitamins and minerals in addition to a significant amount of fiber. A 3.5-ounce (100-gram) serving provides the following nutrients (Greene, 2009): **calories:** 277; **carbs:** 75 grams; **fiber:** 7 grams; **protein:** 2 grams; **potassium:** 20% of the RDI; **magnesium:** 14% of the RDI; **copper:** 18% of the RDI; **manganese:** 15% of the RDI; **iron:** 5% of the RDI, and **vitamin B6:** 12% of the RDI. Dates contain several vitamins and minerals, in addition to fiber and antioxidants. However, they are high in calories since they are a dried fruit.

Furthermore, tiger nut is also a high-nutrient foodstuff which can be beneficial for sustainable health for the older population. Tiger nuts are super high in resistant starch fiber, which has been getting a lot of buzz for its weight loss benefits (Mert, 2015). Resistant starch passes through the stomach and small intestine without being digested, and may even help lose weight by reducing blood sugar spikes and keeping one fuller longer than other foods with the same number of calories. It also benefits the gut by acting as a prebiotic, stimulating the growth of good bacteria in the digestive tract (WHO, 2010). They are rich in a variety of nutrients and have been linked to several health benefits — ranging from better digestion to a reduced risk of heart disease.

Native Banana (*Musa acuminata*) is a popular fruit worldwide due to its flavor, texture, nutritional value, and convenience of being easy to peel and eat (Long, Martin & Janson-Sand, 2010). It contains a lot of nutrients and minerals that are beneficial to health. Its vitamin C content, which is regarded as a familiar antioxidant, is 15% (Pedersen, 2005). Native bananas are usually harvested before being fully mature for domestic consumption. It is found that this *Musa acuminata* contains high fiber, protein and acid insoluble ash when compared to other variety of bananas (Lehmann, 2003).

Objectives of the Study

1. determined the mineral composition of the snacks produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas;

Serial Entrepreneurship

Serial entrepreneurs are people who can repeatedly turn creative ideas into successful business strategies. Serial entrepreneurs can make money by selling their successful businesses and reinvesting the profits in a new startup (Dabic, Vlacic, Kiessling & Caputo, 2021).

One of the greatest examples of serial entrepreneurs is Elon Musk. He's arguably the poster boy for serial entrepreneurs. Musk started his foray into entrepreneurship by founding Zip2 in 1995, which he sold four years later to Compaq for \$307 million (Ovharhe, 2024)

Entrepreneurs face high rates of failure prior to ability to have mindfulness, consciousness, and entrepreneurship spirituality (Ovharhe., 2025d). Research suggests that most of them fail because of lack of technology innovation and creativity in the entrepreneurship world (Ovharhe, 2025c).

However, many entrepreneurs continuously start new ventures; either developing new ventures while operating in an existing firm (portfolio entrepreneurship) or starting a new venture after ending another as serial entrepreneurship or frugal entrepreneurship (2025a).

Dabic, Vlacic, Kiessling and Caputo (2021) find out that serial entrepreneurship is a way forward for the future on ground of innovation, talent, creativity and unleashing future potential as coined by Ovharhe (2025b).

As research suggests, most new ventures fail. The ramifications of failure have traumatic effects upon the individual, leading to depression, feelings of worthlessness, a damaged reputation, depleted social capital, and loss of financial resources (Engel, Werven, & Keizer, 2020).. Hence, the question remains: why do serial entrepreneurs continue? Research has begun to examine serial entrepreneurs, focusing on grief recovery, the ways in which they learn from failure, and entrepreneurs' opportunity identification and implementation skills (Ovharhe, 2024). Given that this research has only just begun (Lattacher & Wdowiak, 2020), and due to this contradiction of failure and continuance of new ventures, more theoretical and empirical research is required (Hsu et al., 2017; Klimas et al., 2021).

Our research focuses on a type of habitual entrepreneurs, serial entrepreneurs who possess different characteristics to those who try for the first time (novice entrepreneurs) or those who run more than one operation at the same time (portfolio entrepreneurs). Serial entrepreneurs are very common and are considered habitual entrepreneurs, exiting one venture before entering into a subsequent one.

The combination of serial entrepreneurs exiting one venture for several reasons, such as failure, personal reasons, or selling the venture, and the continuous reentering of the marketplace due to their previous venture, requires further research (Obschonka & Audretsch, 2020). Essentially, experiences of failure or success form very different learning paths and alternate perspectives regarding restarting conditions which, without specific consideration, could be deemed to clash (Fakhar-Manesh, Pellegrini, Marzi, & Dabić, 2021).).

Past research has explored entrepreneurs who have failed in their ventures and have exited the marketplace permanently due to their substantial personal, financial, and emotional loss. This diminishes their confidence in starting a new venture, impacts their motivation to try again, and affects the extent to which they will take risks (Harry & Chibuike, 2023).

However, this research also suggests that, of those who have failed, many do start new ventures and perform better in comparison to those who have started new ventures for the first time. As such, research now examines the learning effects of previous failed entrepreneurial experiences, such as lessons learned, whether the serial entrepreneur has learned more from failure than from

past success, and the impact on human capital, business plan acumen, and efficiency of opportunity recognition in response to marketplace analysis. Following the call for continued empirical studies of business failures and serial entrepreneurship (Lee et al., 2021), researchers have focused on age and entrepreneurial reentry previous failed versus successful ventures, and their differing learning effects, and how serial entrepreneurs learn from their past experiences (whether failure or success) and improve their performance over time (Pittz, White & Zoller, 2021).

Many individuals may not wish to be entrepreneurs due to the very high risk of failure. Our research does not contradict past research but rather suggests that failure may not be a bad thing, as those who then start a second new venture have a greater chance of better performance. Serial entrepreneurs learn from previous mistakes and implement better business plans. Our research suggests that successful serial entrepreneurs (a term also applicable to habitual and first-time entrepreneurs) have a business plan mental schematic and can value innovative marketplace options realistically.

Over time, the serial entrepreneur develops a generative-based cognitive schema, allowing them to evaluate implementable opportunities.

Sustainable Health for the Elderly Serial Entrepreneurs

The attainment of sustainable health especially for the elderly serial entrepreneur is a major goal of the Sustainable Development Goals agenda (SDGs). This is the broadest level and involves considering the sustainability of everything that impacts on health and well-being of the older populations around the world. Implementing the *Global strategy and action plan on ageing and health* will contribute to the realization of the Sustainable Development Goals which were developed to secure “The Future We Want” for present and future generations. The WHO (2018) notes that today, most people are living longer and a significant proportion of the world’s population is older people. By 2050, the world’s population of people over the age of 60 will double (Alaribe, 2008). This demographic change has strong implications for sustainable development. As people grow older, their health outcomes, needs and what they value can change. Supporting these changes by taking multi-sectoral action on ageing and health is therefore critical and will support the Decade on *Healthy Ageing* 2020 – 2030 (Butler, 2007).

Research has shown that ageing healthily is what most people all aspire to (Alariba, 2008). Healthy ageing is about maintaining the functional ability that allows one to do the things they value. This means preserving both their physical and mental capacity as they age (Butler, 2007); it also means making changes to the environments (housing, transportation, public spaces etc.) so that they are accessible to and supportive of older people with varying needs and capacities. Abraham and Thomas (2009) opined that action to foster healthy ageing can help tackle inequities and ensure older people age safely in a place that is right for them, are free from poverty, can continue to develop personally and can contribute to their communities while retaining autonomy and health. Healthy ageing will also help build societies that are cohesive, peaceful, just, secure and sustainable (Chuku, 2004; Alaribe, 2008; Gregor, 2008).

Theoretical Foundation

Classical Theory (Galen, 1969)

The classical theory of a balanced diet is closely related to common belief about the ideal food and optimal balanced diet. This theory is based on a balanced approach for the assessment of diet, and it still retains its value up to now. In its simplest form, this approach focuses on the part that the body should have a supply, composed of such molecular structure, that would compensate for their expense and loss from the metabolism, work, and for growth that also applies to the young organisms. The classical theory is also based on the following fundamental principles:

- inflow of substances must exactly match their expenses;
- influx of nutrients provided by the destruction of structures and absorption of food nutrients – nutrients needed for metabolism and construction of structures of the body;
- utilization of food is carried out by the body;
- food consists of several components of different physiological significance: food, ballast and toxic substances;

This theory is relevant in the present study in that it emphasized that metabolism is determined by the level of amino acids, sugars, fatty acids, vitamins and some salts, so thus humans can build a so-called elemental (monomeric) diets. Nutrients are called such chemicals or individual elements, that are essential for the body and its vital processes. The common property of proteins, fats and carbohydrates is their ability to satisfy the energy needs. However, they have relatively high levels of energy released when exposed to the digestive enzymes.

Failure of Serial Entrepreneurs

Almeida (2025) uplarge that 66% of serial entrepreneurs have experienced failure at some point, but most persevere to achieve later successes. The difference isn't luck or genius it's strategy, systems, and a specific mindset that allows certain individuals, unlike traditional entrepreneurs, to operate multiple thriving businesses simultaneously. In 2025, with economic uncertainty and rapid technological change, this skill of serial entrepreneurship has become increasingly valuable.

The most successful entrepreneurs, including those from the virgin group, don't view each new business as a separate challenge. They see a portfolio of interconnected ventures, each strengthening the others.

Multiple Ventures by Serial Entrepreneurs viewed that *10% of entrepreneurs are serial entrepreneurs, meaning they have started more than one business.*

Ovharhe (2025) strongly anchor on steps in identifying entrepreneurship opportunities.

The first step to building multiple successful businesses is developing a sharp eye for opportunities. This skill sets serial entrepreneurs apart from those who struggle with a single venture, including early stage startups. With 34.8 million small businesses in the US as of 2025 (99.9% of all businesses), the landscape is competitive but filled with possibilities.

Effective opportunity identification begins with systematic market research. This isn't just casual browsing it's a structured approach to understanding market dynamics, similar to granite systems. You can start by collecting data on industry size, growth rates, and major players. It is better to use tools like Google Trends, industry reports, and competitor analysis to spot emerging patterns. Many successful serial entrepreneurs dedicate at least 3-5 hours weekly to scanning industry publications, social media discussions, and customer review platforms to identify unmet needs.

A critical component of opportunity identification is problem recognition. Serial entrepreneurs train themselves to notice inefficiencies, pain points, and gaps in existing solutions. They keep lists of problems they encounter personally or hear about from others. Each problem, including those related to waste management, represents a potential business opportunity (Ovharhe, & Woko, 2024; Ovharhe & Chibuibe, 2024; Ovharhe & Akandu, 2024).

Ovharhe and Abada, (2023; Ovharhe & Obada, 2024) considers how many successful businesses started because founders couldn't find solutions to their own problems in entrepreneurship entry and entrepreneurship.

Methodology

The area for the study was Imo North, popularly called Okigwe Senatorial District. The area is made up of six local government areas namely: Okigwe, Isiala Mbano, Ehime Mbano, Obowo Onuimo and Ihitte Uboma. According to the National Population Commission, the population of this area is approximately 800,000 (NPC, 2018). These areas have predominantly rural populations, with a few engaged in the entrepreneurship parity. The population is predominantly MSMEs, serial entrepreneurs active in agriculture. The simple random sampling technique was used to select a sample size of 15 enterprise. A comparative statistics and comparative analysis was conducted to present the difference in proximate composition (moisture, crude protein, crude fiber, crude fat, total ash, total carbohydrate and gross energy values), mineral contents (Ca, K, Na, Mg, Mn, Cu, Fe Zn and P) and anti-nutritional factors (phytate and tannin) in the samples (PTC 1, SPC 2 and NBC 3). The analyses were performed using SPSS version 23 (19). Differences in means at $p < 0.05$ were considered significant. The formulated hypotheses were analyzed using Analysis of Variance (ANOVA) at the significant level of 0.05.

Data Analysis

From the study, the null hypotheses were frame as shown beneath

H₀: There is no significant difference in the vitamin composition of the snacks produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas.

Table: Summary of ANOVA on the mean rating of the vitamin composition of the snacks produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas according to (a) PTC1 (b) SPC2 (c) NBC3

Source variation	of Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	8.153	7	1.210	.403	.841
Intercept	18528.547	1	18528.547	6540.613	.010
PTC1	4.871	1	4.871	1.245	.211
SPC2	.454	2	.227	.618	.916
NBC3	1.164	2	.582	.276	.749
Error	95.447	33	2.580		
Total	47927.000	45			
Corrected total	112.800	44			

a. R Squared = .072 (Adjusted R Squared = -.104)

Decision rule: if $p < .05$ reject H_0 , else retain H_0 . NS= Not Significant, $p > .05$; S= significant, $p < .05$

Table 4.4.3 shows that there were no significant differences in the mean rating of the vitamin composition of the snacks produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas according to (a) PTC1 (b) SPC2 (c) NBC3 when analyzed based to PTC1 ($F_{1, 33}=1.245$, $p > .05$), SPC2 ($F_{2, 33}=0.618$, $p > .05$) and NBC3 ($F_{2, 33}=0.276$, $p > .05$) respectively. The implication of this result is that null H_3 was retained.

Major Findings of the Study

The major findings of study are that:

1. The protein, crude fiber, crude fat, ash, carbohydrate and gross energy values of the three snacks samples produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas were normal and therefore healthy for consumption.
2. the moisture content of the samples of the snacks were ideal for preservation of the snacks produced.

3. the mineral content of the three samples were normal; the snacks have rich mineral values which make them ideal and proper foods. Significantly, sodium was low, and this makes the products healthy for the elderly.
4. the Vitamins content of the snacks were normal and rich.
5. The PTC1 sample was most liked by the respondents. This could be because of the combination of sweet potatoes flour, pumpkin flour, and dates flour which could also increase its tastiness.
6. the NBC3 sample was the lowest liked amongst the samples. This could be because it was made basically from unripe native bananas. This implies that the snack may be ideal for diabetic adults.
7. the anti-nutrient compositions of the snacks produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas were low which make the snacks healthy for consumption.
8. families can produce these snacks on their since the raw materials are readily available. This will help improve the quality of older family members, as well promote the development of these foodstuffs.

Conclusion and Recommendations

This study has revealed that some local foodstuffs for serial entrepreneurs which are commonly overlooked are useful for healthy nutrition plans. It can be concluded that the snacks (PTC 1, SPC 2 and NBC 3) produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas are a good sources of some essential minerals and vitamins required by aging populations in most homes. The snacks also showed levels of anti-nutrients. From the highlights of the present study, it can also be deduced that, these snacks may serve as constituents of minerals to humans through dieting. Generally, results and findings from this research agreed favourably with those of other wild plants recommended as food supplement in literature.

Recommendations.

The following were recommended from the findings.

1. Since the NBC3 (which was made basically from unripe native bananas) was liked least, it suggests that many persons may not patronize it. However, it is advised that because the snack may be ideal for diabetic adults, good awareness should be created on the need to consume it more than the sweeter ones.
2. To maintain the anti-nutrient compositions of the snacks produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas, it is recommended that the addition of

artificial additives to make the snacks healthy for consumption especially for aging populations.

Contribution to Scholarship

The following are:

- i. Most serial entrepreneurs like multilayer mineral composition of the snacks serial entrepreneurship produced from pumpkin, sweet potatoes, dates, tiger nuts and native bananas.
- ii. Serial entrepreneurs need nutrient-dense diet.

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