

TRADITIONAL FOOD AND HEALTH IMPLICATION WITH REFERENCE TO APATANI TRIBE OF ARUNACHAL PRADESH

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Abstract: Food and life is synonymous to each other; because nutrition required for maintaining health is supplied by food we eat i.e. food habit. Although there are several factor that determines the food habits of any community in general, however culture and biogenetic trait predominantly shape our food habit. Thus directly or indirectly controls the nutritional supply; hence some cultural group are more susceptible to particular disease while other group to certain diseases. Thus the overall health status of any culture group is determines by culture food practice. This paper attempt to explain and analyses what defines the food habits of Apatanis and the impact of traditional food habit on the health of the community.

Material and Method: A Cross-sectional field survey was done on a population representative sample of 180 of Apatanis. Dietary survey (24hr. dietary recall and food frequency) and open-end interview schedules. SPSS was used for data analyses and other secondary sources were used to analyses and established the interrelation between traditional food habits and health outcome.

Results: Analyses indicates that only 8.9% of the population take pulse and 9.4% takes milk product and 22.2% takes meat, major source of protein on regular basis. Frequent intake of indigenous dish like "Tapyo, Pike Pilla, fermented rice beer" are hazards to health.

Keyword : Traditional Food habit, dishes and Health

Introduction: Traditional food is defined as which the food eats by a cultural group in particular geographical area. Composed of food items from local produced and environment which is culturally accepted. Traditional food embedded with sociocultural meanings, acquisition/processing techniques, use, composition, and nutritional consequences for the people using the food, the knowledge of how to prepare are passed down from generation (Durning, 1992). Cuisine becomes central to many of the issues concerning retention of traditional food knowledge and use of traditional food systems by indigenous peoples is the issues of politics, it is practice and retain cultural knowledge and values (Boun AT, 1991). The food represents group identify with a culture, reveal the ethnicity and most importantly used as an expression of individuality and ideology. Indigenous people refers to a cultural group in a particular ecologic area that developed a successful subsistence base from the natural resources available (Robson, 1980). The major qualities of traditional food of indigenous people that requires attention are substance, like the culture, food habit also various from species to species diversity depending on the natural environment in diverse climates and latitudes, what considered as food is determined by culture. The traditional techniques of harvest and processing the food, and the sensory qualities and dietary structure developed for food selection determines the availability of food. These qualities determine the chemical composition of the indigenous food items and the nutritional content of the diets of indigenous peoples (John T, 1988).

Traditional cuisine is always close to heart, affinity for their traditional food. It is always perceived as pure and healthy. No matter much one may progress in global but people connect their culture through food, therefore irrespective of nutrition and consequences people continue to consume and preserved their culture through food practice by cooking and eating traditional cuisines. Likewise, 'Tapyo Pike Pilla' are one of the most celebrated traditional cuisines of Apatani, has a high affinity for this dish by every class of the society. Despite food transition taking place tremendously among tribes, traditional cuisine seems hard to replace. This paper attempts to highlight the traditional dishes and its possible impact on the health of the community.

Tapyo and Sodium Carbonate: Traditional food, Tapyo, and Pike Pila one of the most celebrated dish of Apatani is the Indigenous version of Sodium carbonate (Na_2CO_3), commonly known as washing soda, soda ash, and soda crystal is the water-soluble sodium salt of carbonic acid. Because of the chemical properties, characteristics, usage and extraction process of 'Piu' is similar to Soda Ash extraction. Tapyo, has a strongly alkaline taste and forms a moderately basic solution in the water like Sodium carbonate.

This indigenous soda ash 'Piu' is extracted from ginger millet stem (Eleusine coracana), waterweed (milang), silver fern and Phragmites karka (pehpu), usually grow on riparian (Dollo, 2009). It is dried, burned, then ash is put into a conical apparatus, water is slowly poured, below bowl is placed to collect the filtrate water. The final product Tapyo is produced by a condensation process, soda water pila

are poured on the hot pan, water is evaporated; the residue is remained intact on the pan. It is an exhaustive and long process. Likewise, in Middle east and in European countries like Spain, Scotland, Sodium carbonate is extracted from the ashes of various plants growing in sodium-rich land, kelp, seaweed species (fucus) and several "halophyte" (salt-tolerant) plant species, the land plants such as glassworts or saltwort are harvested, dried, and burned. Then the ashes are "lixivated" to form an alkali solution. Then the solution is boiled dry to produce the final product, which is termed "soda ash"; this refers to the archetypal plant source for soda ash, which are the small annual shrub *Salsola soda* ('*barilla plant*') (Kiefer, 2012,). Commercially, it is produced by mining (Green river, Wyoming in North America, Trona in Turkey, Lake magadi in Kenya), Leblanc process (1791), the sodium carbonate is extracted by allowing the water to evaporate from the ashes. Solvay process (1861), sodium bicarbonate is converted to sodium carbonate by heating, Hou's process (1930). This process was developed by Chinese chemist Hou Debang. The byproduct carbon dioxide is pumped through a saturated solution of sodium chloride and ammonia to produce a sodium bicarbonate, which is gathered as a precipitate because of its low solvency and after that warmed to yield immaculate sodium carbonate. Sodium bicarbonate reacts with carboxyl groups in proteins to give a brisk effervescence from the formation of CO₂.

Tapyo, the indigenous salt of Apatanis for centuries people have been using this substance in regularly in diet sometimes as a solid pure form or in form of dishes. Apatani believes that these Tapyo contains iodine and prevent the Apatani from goiter and other associated diseases. Although so far scientific investigation has done in this area (absent of goiter among Apatani), the claim is based on assumption. However, these paper attempt to highlight the risk of excess consumption of this traditional food.

Uses of Sodium Carbonate: Sodium bicarbonate has a wide variety of uses. In chemistry, it is often used as an electrolyte. Electrolytes are generally salt-based, and sodium carbonate goes about as a decent conductor during the time spent electrolysis. In a domestic household, it is used for water softening in the washing technique. Sodium carbonate is also used as a piece of dress included substances, machine dishwashing things, surface cleaners, restroom cleaners and other family cleaning things. Sodium carbonate in water has been utilized as a part of the past for splashing of garments, dishwashing, floor washing, degreasing operations and for individual care, pool & spa, pesticide, fungicide, cotton and cement industries (de Brito-Ashurst et al, 2009). In healthcare, Sodium bicarbonate is used as an antacid

to treat acid indigestion and heartburn. It is also used for treatment of hyperkalemia, diminishes aspirin absorption in the case of an overdose tricyclic antidepressant overdose (Mark et al., 2003), to relieve some kinds of insect bites and stings, diminish itching caused by toxic plant, in local anaesthetics, sodium carbonate is added to accelerate the onset of their effects and reduce pain, use in nasal surgery (Nelson, 1998), toothpaste and mouthwash, it kills the generation of corrosive in the mouth, furthermore goes about as a germ-free to anticipate diseases, use in blepharitis treatment (Tim, 2014), cancer and cardiac treatment etc. According to Aschner (2008), sodium bicarbonate therapy has long been removed from guidelines for advanced cardiac life support, as a review of the medical literature shows no beneficial effect of sodium bicarbonate on survival rates. In fact, an alternative treatment like Tullio Simoncini, have been discouraged as it was identified as a potential threat in used of sodium carbonate by American Tumor Society (ACS, 2008, Wilson R. F, 2013, Mark et al., 2003). Because of some side effects such as hypokalemia, ionized hypocalcemia, hypercapnia, hemodynamic instability, particularly during hemodialysis sessions, arise in the urinary excretion of sodium, and the potential to deteriorate vascular calcifications on chronic administration with sodium bicarbonate therapy.

In cooking, sodium carbonate is used to change the pH of the surface of the food and improve browning, as food additive (E500), as an acidity regulator, anti-caking agent, raising agent, and stabilizer, Kansai a solution of alkaline salts used in ramen noodles to give characteristic flavor and texture and in producing sherbet powder. In China, it is used cooking moon cakes, and in numerous other Chinese steamed buns and noodles, while Latin American sodium carbonate is utilized to soften the meats. Sodium carbonate is extensively used and produced through the world, although there is no evidence for a high acute toxicity, sensitization, carcinogenicity or a chronic toxicity in normal usage of Sodium carbonate. However, an overdose of sodium bicarbonate can be hazardous to health and aggravate the situation and gastrointestinal disturbance is of specific concern (William, 2004). Sodium carbonate is noncorrosive substance but exposure to sodium carbonate of 0.1 ml or 0.1 g cause local irritation in particular to mucous membranes of the eye due to the alkaline properties (de Brito-Ashurst et al, 2009). The high consumption of sodium carbonate has been associated with cardiovascular sickness because the substance is easily absorbed by the respiratory and digestive tracts, can irritation of the higher respiratory tract, pulmonary irritation. The inhalation of the product can worsen preexistent respiratory problems such as

asthma, emphysema, and bronchitis. Skin contact can worsen pre-existent dermatitis.

The consumer exposure to sodium carbonate by inhalation, oral uptake and skin contact to solid sodium carbonate via laundry, personal care is negligible and therefore the associated risk is also negligible. The studies reveal that skin absorbs approx. 0.8 µg sodium and 1.0 µg carbonate. Although effect is negligible and no risk to pH of the blood in compared to the normal daily dietary uptake of sodium of 3.1- 6.0 g but overall accumulation of sodium carbonate in the body above recommended dose of 2.0 to 3.0g can be acute lethal effect (LD₅₀ is not lower than 2000 mg/kg body weight). The predominant symptoms are stridor, drooling, and respiratory distress. When sodium bicarbonate is taken beyond the capacity of the kidneys to excrete excess bicarbonate may cause metabolic alkalosis, resulting in renal failure, or when enhanced tubular reabsorption of bicarbonate then depletion in volume was observed (Wilson, et al 2013, Cooper et al. 1990, Nakashima et al. 1996). In patients on calcium supplements may develop milk-alkali syndrome with additional sodium bicarbonate intake, which can result in metastatic calcification, kidney stones, and kidney failure (Hindman et al, 1990, Ryder et al, 1994). In those patients with several stages of CKD, frequent urine extraction has been consistently being observed with sodium bicarbonate supplement (Goraya et al, 2011, de Brito-Ashurst et al, 2009). As per California Poison Control System of retrospective review of between year 2000-2012, concludes that excess usage of baking soda may lead to severe acid-base and electrolyte alterations or respiratory depression among children, pregnant women, alcoholics, and diuretics patients when it is frequently used as an antacid (Al-Abri S. A. et. al, 2014). Some of the associated symptoms due to increased sodium bicarbonate includes irritation of gastrointestinal tract, vomiting (may contain blood), diarrhea, abdominal pain, collapse, frequent urination, headache, heartburn, edema due to sodium overload, congestive heart failure, hyperosmolar syndrome, hypovolemic hyponatremia, and hypertension even death.

Area of study: Apatanis are one of the major tribes of Arunachal Pradesh, Northeast India an inhabitant of Ziro valley which is situated at 5574 ft. above sea level. The valley has rich flora and fauna, the vegetation such as pine, oak, fir, exotic orchid, herbs, and ferns etc. are found. This tribe belongs to mongoloid race and practice shamanic culture in traditional society. the agriculture is the primary economic of the Apatanis, they practice sedentary cultivation and are self-sufficient agrarian society. Apatanis are famous in the state for their advance

technique traditional cultivation and fish-cum-paddy cultivation.

Methodology: The cross-sectional dietary survey was conducted with population representative of 180 respondents were interviewed, using 24hr dietary recall and in-depth interviews with the key informant in order to capture the cultural aspect of traditional food practice. Further investigated on the history of the health status of respondents to identify the prevailing symptoms associated with food habit. The data was analyzed using spss software and secondary source were used in interpretation.

Finding and Analysis: Apatanis are rice eater and mostly eat leafy vegetables and meat. Traditional dish one of the most popular dishes of Apatanis. As per the data, reflects that 1.1 per cent respondents eat pike or pila on the regular basis, 42.8 per cent respondents eats at least once or twice in a week, 46.1 eats once or twice in a month and 8.9 per cent eats rarely. Overall 88.9 per cent respondents use Pila or Tapyo in their diet. Many of respondents knew consequences of excess intakes of a traditional dish because of the symptoms they have had experience after eating spicy Pike or Pila such as heart burning "Aha abang", nausea, vomiting, and passing urine frequently in little quantity or urge for unination "Si siku simu" as informed by the respondents still people continue to eat because of addictive. As per concern to health, almost every respondent has had experienced to symptoms associated with food habit such as gastritis, diarrheas, headache, nausea, weakness, hypertension or was diagnosed with renal diseases etc. at the time survey. In traditional society Tapyo is not just an edible substance, but also endow with great cultural importance in Apatani society, it is largely used in every social event and religion ritual.

Apart from consumption, it was also used for cleaning and washing in earlier days' people in place soap, an extremely dirty dress such as inner wear or other cloths soaked in pila for a day to exterminate the hidden lice in cloth, used for washing when it is itching or lice. Sometimes a sip of Pila is taken to refresh one's mouth or stimulate the taste buds.

Highlight of Traditional cuisine of Apatanis Piu: (Ash) Usually silver fern, millet stem, kelp (focus species), Phragmites karka is died and burn to ash, is called Piu in Apatani. It can also be extracted from the plant growing in sodium-rich soils e.g. kelp in Scotland and seaweed in Spain. The synthetic product is commonly known as Soda ash which is produced from sodium chloride and limestone by Solvay process.

Pila: Filtered Water extracted from Piu, ash is filled in a conical funnel and slowly water is pour over, below a bowl, is kept to liquid drop. This Pila is like a base for making several other dishes. **Pila:**

Traditional side dish made by a smoking process. Chili, salt, intestine or heart of any substance of choice is stuff inside the bamboo sap with liquid extracted. The mouth of the sap is closed with corn husk. It is placed over the fireplace, smoked till the stuff inside is cooked. It is considered to be one the most authenticate and prestigious traditional dish, usually, it is prepared only for the social event.

Pila: Using liquid extracted as based, salt, chili, tomato or bamboo shoot is placed in a bowl, then pork oil or cholesterol of a pork is burned from the above. The stuff in the bowl is cooked by dripping heat of the fats.

Pike: One of the most celebrated traditional dish of Apatani. Basically, it comprised of salt, chili, pork fat and extracted liquid. Firstly, stuff (of choice like cartilage, smoked beef, champaca, bamboo shoot, chives etc.) is boiled with salt and chili and pork fats, when it is getting cooked then extracted liquid pila is added in the end. Pork fat is act as a catalyst between liquid extract Pila and stuff give distinct taste and authentic taste of a traditional dish.

Tapyo: Prestige and celebrated indigenous salt of Apatani. Socially significant as it is used in religion ceremony and ritual. Basically, it is condensed form or solid form of Pila liquid extracted soda. It has a strong alkaline taste. The traditional technique of transforming liquid into solid form was confined only to Apatani tribes in early days when there was no supplied salt in the region. **Discussion:** Traditional food is part of a culture that carries cultural identity and values, despite changing consumption pattern; traditional dish remains as a favorite dish to people either it is consumed on daily basis or on the social occasion. Most of the traditional food practice, particularly among indigenous tribes is shaping into modernized diet due to the influence of changing the food system, yet people preserve the traditional cuisine at most authenticate form. Likewise, one of the most popular traditional dishes of Apatani is Tapyo, indigenous salt (indigenous sodium carbonate) and byproduct dishes have been consuming by Apatanis for centuries, since when and how it was discovered is unknown. In whole Arunachal Pradesh Apatanis are the only tribes knew the skills of producing sodium carbonate and use in their diet, whereas this substance is unknown even to nearest tribes of Apatanis. But it is also used by some of Assamese tribes people and other Northeastern tribes in their diet, however, the quantity and frequently consumption vary from region to region, usually much lesser as compared to Apatani's consumption. The process of extracting soda ash is similar but mostly plain tribes of Assam extract from the plant such as papaya stem, banana stem, peel, the leaf of peas used in liquid form whereas, Apatani used millet stem, water weed, and silver fern. Further, it is

processed into a solid substance. Although it is consumed in both liquid and solid form.

Many believes that Tapyo or pila contain iodine due to which it prevents the Apatani population from goiter (Dollo, 2009), this claimed is based on circumstantial scenario, as goiter is almost nil among Apatani tribes whereas goiter was highly prevalent among neighboring tribes (Nishi do not use Tapyo or Pila in their traditional food) before introducing iodine salt to the population but as the reviews there is no report of iodine presence in sodium carbonate substance or its byproduct. Although it is considered to be the safe and negligible effect when it is consumed moderately, in fact, sodium bicarbonate is used as medicine and personal care, however, an overdose of sodium carbonate proved to be a lethal effect on the body, most of the associated diseases are related to renal and cardiac disease. From the data, it cannot be directly established the relation between indigenous salt and symptoms prevail among Apatani population such as liver cancer, renal diseases, gastritis and general weakness, most of the patient with a renal disease or hypertension has a history of excess fondness for traditional dish '*Spicy Pike Pila*'. The traditional food habits of Apatanis comprised leafy vegetables, rice, meat. The large portion of diet contains season herbs and berries which are rich in nutrients with medicinal properties. In spite of rich diet, nutrition deficiency associated diseases are common among Apatanis, one of the factors behind deficiency could be the regular intake of sodium carbonate in a diet as it neutralized the nutritional property of the food item due to it alkali properties, thus deprived the body of sufficient nutrient. Accumulation of sodium carbonate beyond the recommended dose 2.0 to 3.0g through oral, inhalation and direct skin contact, considered to be hazardous to health.

Conclusion: The traditional dish such as '*Tapyo or Pila*' are the indigenous versions of Sodium Carbonate or soda ash, if it moderately consumed, it can be beneficial to health and excess intake lead to lethal to an organ responsible for acute diseases such as hypertension, kidney stone, gastritis, and cardiovascular disease and mild symptoms are heartburning, vomiting and urine infection. The prevalence of such symptoms among Apatanis are the attributes of traditional food habit '*Pike Pila*', which the people have been consuming throughout the ages in high quantity and frequently in their diet. Considering the fact, traditional food habit should be modified for a healthier diet without losing its unique and authenticity of traditional taste. There are always scope for improvement through awareness on nutrition education and behavior towards food practice.

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