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RESEARCH ARTICLE

MUNGBEAN SPROUT PRODUCTION IN CALABARZON REGION, PHILIPPINES

Gatbonton Ma. Cecilia C., Molon Cornelio R., Agatep Robert C. and Beato Lolita L.
College of Agriculture, Laguna State Polytechnic University, Siniloan, Laguna, Philippines.

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Abstract

The mungbean sprout industry plays a significant role in strengthening microenterprise development and in ensuring food and nutritional security in the Philippines. A survey was conducted in order to generate relevant information towards the identification of appropriate initiatives for the advancement of the industry. Twenty-one mungbean sprout producers were identified and interviewed. Results show that majority of the respondents, who have an average age of 51 years, indicate that mungbean sprout production is their primary source of income and they have been in the business for no less than 10 years. Their knowledge on mungbean sprout production was just based on experience. Most of the producers were not able to go beyond secondary education and all have not attended any seminar on sprout production. Aside from family members, most of the producers hire laborers to be involved in the production cycle. The volume of production ranges from 1.5 to 300 kilograms of mungbean seeds per cycle. All of the producers are using the small, yellow mungbean seed variety which is being marketed mostly by the Filipino-Chinese traders. The demand, but not the price, for sprouts is being influenced by the season of the year, increase in the prices of local vegetables, and the customs and traditions of the people. The major problems of the mungbean sprout producers are the high price of imported mungbean seeds, spoilage of sprouts due to poor mungbean seed quality and contamination, and the imminent competition with the Filipino-Chinese traders who also control the supply and prices of imported mungbean seeds. It is recommended that the mungbean sprout producers must be organized and be extended with appropriate trainings and assistance by concerned agencies and entities in order to improve their status and productivity. Likewise, an intensive local production program on high quality mungbean seeds should be initiated to lessen the dependence upon imported varieties.

Introduction:-

The Second Progress Report on the Millennium Development Goals (MDGs) launched by the National Economic and Development Authority (NEDA) and the United Nations Country Team (UNCT) in 2005, shows that the Philippines will likely achieve the targets on reducing the proportion of people living in extreme poverty by half in 2015. As of 2003, 30.4 percent of Filipinos were considered income poor compared to 33 percent of Filipinos in

Corresponding Author:- Gatbonton Ma. Cecilia C.
Address:- College Of AgricultureLaguna State Polytechnic University, Siniloan, Laguna, Philippines.

2000. Some of the priority initiatives that need to be pursued in achieving the MDGs are to strengthen microenterprise development and to improve food security at the macro and household levels (NEDA 2005).

According to Ebert (2013), sprouts and microgreens are easy to grow and can produce nutritious food quickly with no need for pesticides or fertilizer. When safely produced and properly promoted, these crops can enrich diets and also provide income generating opportunities for small-scale entrepreneurs.

Sprouts are also called functional foods due to their high content of bioactive compounds. These are commonly seen in Asian cooking (Young 1990; Lal 2001). Sprouts are usually eaten raw as components of salads or slightly cooked in various dishes. Alfalfa, radish, broccoli, clover, and soybean sprouts contain a wide range of medicinal compounds in sufficient dosage to treat and prevent disease (ISGA 2013). Sprouting improved the nutritional worth of the mungbean in terms of higher concentration of nutrients and improved protein content (Shah et al. 2011; Gatbonton 2012).

In the Philippines, mungbean (*Vigna radiata* /L./ Wilczek), popularly known as *mungo* or *balatong*, is the main crop used in sprout production. Sprouts are gaining popularity as a major ingredient in many foods offered in restaurants, food carts in malls, and even in the home kitchen in the country (Gabriel 2005; Andam 2010).

Sprouts are formed from germinating seeds. Sprouts of mungbean and other legumes are considered highly nutritious and are outstanding sources of protein, vitamins and minerals (von Hofsten 1979; Lorenz 1980; Marton et al 2010; Ebert 2013). Sprouting increases the bioavailability of both macro and micronutrients, such as protein and some minerals. The level of anti-nutritional factors could also be reduced by the germination process (Hedges et al 2006; Marton et al. 2010). It was well established that due to the biochemical changes during germination, sprouts compared to the seeds, has a higher nutritional value. Sprouts contain significantly higher polyunsaturated fatty acid content, higher vitamin content and better utilization of minerals than the respective dry seeds (Marton et al. 2010).

In the Philippines, limited studies about sprouts and the sprouting business, even with the popular mungbean sprouts or toge, were conducted. The objective of the study is to gather baseline information on mungbean sprout production in Region IVA – Calabarzon. This region, consisting of five provinces, is the largest of all regions in the Philippines and has a population of 12.61 million people. Calabarzon is the second largest contributor to the national GDP, accounting for 17% of the gross domestic product. Much like the rest of the country, the region is caught in the middle of being an industrial and an agricultural economy. Facts and figures as to the profile of the mungbean sprout producers and their business will be very significant in establishing government initiatives in advancing the sprouting industry. The present study also gathered information that could be used in developing R and D priorities. The development of the industry would complement the efforts in improving the nutritional status of Filipino families. It could significantly contribute in generating employment opportunities among rural communities and provide a viable source of income for small households.

Methodology:-

A survey was conducted in the five provinces of the Calabarzon (Southern Tagalog) region, namely Cavite, Laguna, Batangas, Rizal and Quezon. All possible means to identify all the sprout producers in the region was exhausted, including appropriate coordination with the various offices of the Department of Agriculture (DA) in the provincial and municipal levels, as well as with the public market administrators. Twenty one sprout producers were interviewed.

Personal interviews using pre-tested questionnaires were conducted to gather information on the volume of production, type of seeds used, sprouting and marketing practices and problems encountered in the production and marketing of sprouts. The demographic profile of the respondents such as age, gender, civil status, household size, educational attainment and number of years in the business were also gathered.

The study team assured the respondents that the information given by them would not be used against their interest. Interviewees were requested to give truthful information as much as possible. To ensure the quality of information, the questionnaire was checked to ensure that information to each of the items had been correctly recorded.

Due to limited number of samples, a simple visual association of the collected data was done. However the Pearson's r was also employed whenever possible.

Results And Discussions:-

Demographic profile of the mungbean sprout producers

Twenty – one (21) mungbean sprout producers, majority of them are females, were identified in the study (Table 1). Eventhough, most of the producers came from Batangas, the volume of production in the province ranges only from 1.5 – 15 kg mungbean seeds per cycle. Most of the sprouts being produced in the region came from Cavite. The volume of production per cycle in the province ranges from 50 to 300 kg (Figure 1). More than 50% of the producers are just high school and elementary graduates, have not attended any training in sprout production and just relied upon experience for their practices in the sprouting business. More than 40% of the respondents revealed that their only source of income is mungbean sprout production and more than 70% of them use their personal money to finance their business.

Production practices of the sprout producers

The mungbean seed preferred by the respondents in the production of sprouts is the small-sized yellow variety. Almost 50% of the seeds were purchased from the Filipino – Chinese traders in the Divisoria area of Metro Manila at Php 1, 600.00 per 25-kg bag. Divisoria is a market district in the heart of the City of Manila known for its wide assortment of low-priced goods and wholesale and bargain shopping. From dry goods, fruits, agricultural products and "everything under the sun" can be found in Divisoria, making it 'the center of value shopping" and "the mother of all markets in Manila". The mungbean seeds being sold by retail in public markets (at Php 80.00 per kg) were actually sourced also from Divisoria.

The labor involved in the production of sprouts are mainly contributed by family members but more than 75% of the respondents hired at least two persons on the average to augment family labor which are being paid on a daily or on a monthly basis. The big producers usually pay their laborers at a higher rate.

About two-thirds of the sprouts produced in the region are of the long type. The short sprouts are mainly produced by the producers in the Batangas province and are sold alone in their local market.

To induce sprouting, an average soaking length of 6.6 hours is being practiced and an average watering interval of 4.33 hours is also being observed. Some of the producers however mentioned that soaking depends upon the age of seed, shorter soaking length of 4 hours for old seeds or 7-8 hours for new seed. Likewise, it has been observed that the watering interval is longer in the small producers (6 hours) compared with the big producers (4 hours) (Figure 2). As to the source of water, more than 75% of the sprout producers get their water requirements from the water district while the big producers in Cavite province managed to have put up their own submersible pumps.

Marketing practices of sprout producers

Seventy – five percent (75%) of the producers, mostly are small producers, sell their sprouts within their town or province of residences while more than 23%, mostly are big producers from Cavite, marketed their sprouts in Divisoria and other city markets in Metro Manila as well as in the province of Bulacan (Table 3). These big producers also own vehicles which are used for delivery.

More than 70% of the respondents are selling their sprouts to both wholesalers and retailers, while 14.29% each prefer to sell their products to either wholesalers or retailers alone. Likewise, the most preferred mode of payment is either on a consignment and/or on a cash basis.

These big producers likewise were able to construct concrete vat for the production of sprouts while more than 85%, mostly small producers, are using only plastic drums or pail as sprouting containers.

The most in-demand packaging size of sprout products is 500 g (Figure 3) while the least is 250 g. The 250 g pack is being preferred by buyers in Batangas which have more preference on the short sprout or "pasibol". The short sprout/toge, however commands higher price at Php 70-80/kg compared with the long sprouts which are being sold at Php 22-25/kg .

It was likewise found out that season influences the demand but not the price of sprouts. The highest demand for sprouts is very notable during summer months especially during the observance of the Holy Week and during the celebration of Christmas and New Year during December. Since majority of the Filipino population are Roman Catholic and abstain from meat on Fridays during Lent, savory dishes such as ginisang toge (sautéed mungbean

sprouts) and lumpiang toge (spring rolls) with shrimp or fish, are traditionally served on Fridays. In the province of Batangas and some parts of the Calabarzon region, people believe that having sprouts in their New Year's eve menu will bring more blessings and good luck for the whole family. In addition, it was also observed that increase in the prices of local vegetables, causes an increase in the demand but not in the price of sprouts.

Problems in sprouting industry

There are three most pressing problems that are mentioned by the respondents in the operations of their sprouting business: (1) high price of imported mungbean seeds; (2) sprout spoilage which they have attributed to the poor quality of mungbean seeds and microbial contamination of the water and the containers they are using; and the (3) imminent competition with the Filipino – Chinese traders who also control the supply and prices of imported mungbean seeds.

Another problem that some of the big producers have encountered is "laborer piracy" or the transfer of their laborer/s to other sprout producers.

To address the problem on spoilage, one of the producers have introduced certain innovations in his production practices like the use of purified water in watering the sprouts, daily cleaning of sprouting containers with detergents (Figure 4) and daily brushing of the flooring of the sprouting area in order to ensure the avoidance of microbial contamination.

Table 1:- Profile of the mungbean sprout producers in Calabarzon Region, Philippines. (n=21).

Profile	Mean	Range
Age, years	51.24	35-66
Household size	4.86	2-9
Number of years in mungbean sprout production	19.95	1-50
Volume of production per cycle, kg	63.4	1.5-300
	Percentage	
Sex		
Male	33.33	
Female	66.67	
Province		
Batangas	33.33	
Cavite	21.31	
Laguna	9.52	
Quezon	4.76	
Rizal	28.57	
Educational attainment		
Elementary	38.10	
High school	14.29	
Vocational Course	9.52	
College (undergraduate)	28.57	
College graduate	9.52	
Primary source of income		
Mungbean sprout production	42.86	
Mungbean sprout production and others	57.14	
Source of capital in sprouting		
Personal money	71.43	
Informal money lending	28.57	

Table 2:- Production practices of the mungbean sprout producers.(n=21 unless otherwise specified).

Practices	Mean	Range
Length of soaking, hrs	6.60	5.0 – 9.0

Watering interval, hrs	4.33	2.5 – 6.0
Number of hired workers (n=16)	2.14	1.0 – 8.0
	Percentage	
Source of seeds		
Metro Manila (Divisoria)	47.62	
Within the town/province	52.38	
Type of sprouts produced		
Long sprouts	66.67	
Short sprouts	28.57	
Long and short sprouts	4.76	
Water source		
Water district	76.19	
Deep well	9.52	
Submersible pump	14.29	
Type of sprouting container		
Plastic drum	52.38	
Pail	33.33	
Concrete vat and plastic drum	14.29	
Mode of payment of workers' salary		
Daily (Php100-400/day)	18.75	
Monthly (Php3,000-6,000/month)	81.25	

Table 3:- Marketing practices of sprout producers in Calabarzon Region.(n=21).

Practices	Percentage
Place of marketing	
Within the town/city	38.10
Within the province	38.10
In other provinces including Metro Manila	23.80
Type of buyers	
Wholesalers alone	14.29
Retailers alone	14.29
Both wholesalers and retailers	71.42
Size of packaging	
250 g	15.78
500 g	34.21
750 g	21.05
1 kg	28.95
Sprout peak season	
Holy week (summer)	42.82
December (Christmas, New Year)	38.10
Others	19.04
Preferred mode of payment	
Consignment	23.81
Cash	9.52
Consignment and/or cash	66.67

Figure 1:- Commercial mungbean sprout production in Cavite, Philippines.

Figure 2:- Watering of sprouts in concrete vat (Imus, Cavite, Philippines).

Figure 3:- A bundle contains ten 500-gram packs of sprouts.

Figure 4:- Sprouting containers being dried after washing them with detergents.

Conclusion and Recommendation:-

Aside from providing a valuable source of safe, healthy and highly nutritious food, mungbean sprout production is a profitable small-scale (even a large scale) enterprise. However, the income from sprout production is significantly affected by the unstable supply and price of the mungbean seeds used for sprouting. The unavailability of a reliable local mungbean variety that is ideal for sprouting aggravates the dependence of the sprout producers upon the high-priced, imported, small-seeded yellow mungbean variety. The quality of the mungbean seeds and microbial

contamination, as claimed by the producers, are some of the possible causes of sprout spoilage which consequently affect the production and income cycles of the sprout producers.

It is recommended that the mungbean sprout producers must be organized and be extended with appropriate trainings (e.g., on food safety and prolonging the shelf-life of sprouts) and assistance by concerned agencies and entities in order to improve their status and productivity. Upholding the status of the mungbean sprout industry would make it a more suitable and sustainable contributor in the attainment of the government's development goals of eradicating poverty and malnutrition in the country. Likewise, an intensive local production program on high quality mungbean seeds that are ideal for sprouting should be initiated to lessen the dependence upon imported seeds.

References:-

1. Andam CJ. 2010. Mungo Sprouts for Healthy Meals. Agriculture Magazine, Vol. XV, No. 7. Manila Bulletin: July 2010.
2. Ebert AW. 2013. Sprouts, microgreens, and edible flowers: the potential for high specialty produce in Asia. In: Proceedings of the Regional Symposium on High Value Vegetables in Southeast Asia: Production, Supply and Demand (SEAVEG2012), 24-26 January 2012, Chiang Mai, Thailand. Holmer R, Linwattana G, Nath P, Keatinge JDH, eds. 2013. AVRDC – The World Vegetable Center, Publication No. 12-758. AVRDC – The World Vegetable Center,Taiwan.
3. Gabriel AA. 2005. Microbial Quality of Chlorine Soaked Mung Bean Seeds and Sprouts. Note. Food Sci. Technol. Res., 11 (1), 95-100, 2005. (https://www.academia.edu/592514/Microbial_Quality_of_Chlorine_Soaked_Mung_Bean_Seeds_and_Sprouts) (2/2011)
4. Gatbonton MC. 2012. Mungbean Sprout Production and Marketing Practices in Sta. Cruz, Laguna (Abstracts). 2012 In: ISSAAS (International Society for Southeast Asian Agricultural Sciences) International Symposium and Congress. (Copyright)
5. Hedges LJ and Lister, CE. 2006. Nutritional attributes of legumes (2) sprouted beans and seeds. Crop and Food Research Confidential Report No. 1795. New Zealand Institute for Crop and Food Research Limited. (http://www.vegetables.co.nz/resources/1files/pdf/booklet_brassicas_foodreport.pdf)(2/2010).
6. International Sprout Growers Association (ISGA) 2013. Public Relations Support for the Sprout Industry. (https://icserv2.securesites.net/contributiongen.htm)(5/2013).
7. Marton M, Mandoki Zs, Csapo-Kiss Zs, Csapo J. 2010. The role of sprouts in human nutrition. A review. Acta Univ. Sapientiae, Alimentaria, 3 (2010) 81-117. (http://www.acta.sapientia.ro/acta-alim/C3/alim3-5.pdf) (4/2010).
8. National Economic and Development Authority. 2005. 2nd Progress Reports on the MDGs Vol. X No.30 June 30, 2005.
9. (http://www.neda.gov.ph/econreports_dbs/MDGs/DevPulse_MDG/MDG_PartI.pdf)(3/2012).
10. Lal G and S Shanmugasundanam. 1990. Updated in 2000. Mungbean Sprout Production. AVRDC The World Vegetable Center. (Retrieved at http://www.avrdc.org/pdf/wp14 mungbean.pdf) (1/2010).
11. Lorenz K. 1980. Cereal sprouts: composition, nutritive value, food applications. Critical Reviews in Food Science and
12. Nutrition 13(4): 353-385.
13. Shah SA, Zeb A, Masood T, Noreen N, Abbas SJ, Samuillah M, Alim MdA, Muhammad A. 2011. Effects of sprouting time on biochemical and nutritional qualities of Mungbean varieties. African Journal of Agricultural Research Vol. 6(22), pp. 5091-5098, 12 October 2011 Available online at http://www.academicjournals.org/AJAR DOI: 10.5897/AJAR11.480 ISSN 1991-637X ©2011 Academic Journals. (5/2013).
14. von Hofsten B. 1979. Legume sprouts as a source of protein and other nutrients. J. Am. Oil Chemists' Soc. 56: 382.
15. Young Carrie. Mung Beans, 1990. (Retrieved at http://www.rain.org/greennet/docs/exoticveggies/html/mungbeans.htm on April, 2010).