SHORT REVIEW ON THE CONDITION OF GREEN BEAN PRODUCTION AND ITS PACKAGING

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ABSTRACT

From the viewpoint of consumer acceptance, packaging is the main issue in marketing in such extent that package called “silent seller”. The goal of packaging is not only esthetics but considers as a reducing cost-effective method as well as prolongation of shelf life. Green beans which is one of the important legumes in agriculture strategic methods. The goal of this short review is to study on different conditions of green bean's cultivation and the deep point of its packaging.

KEY WORDS
Green bean, Packaging, Growth condition.

The principal roles of food packaging are to protect food products from outside influences and damage, to contain the food, and to provide consumers with ingredient and nutritional information. Traceability, convenience, and tamper indication are secondary functions of increasing importance. The goal of food packaging is to contain food in a cost-effective way that satisfies industry requirements and consumer desires, maintains food safety, and minimizes environmental impact. Protection/preservation Food packaging can retard product deterioration, retain the beneficial effects of processing, extend shelf-life, and maintain or increase the quality and safety of food. In doing so, packaging provides protection from 3 major classes of external influences: chemical, biological, and physical. Chemical protection minimizes compositional changes triggered by environmental influences such as exposure to gases (typically oxygen), moisture (gain or loss), or light (visible, infrared, or ultraviolet). Many different packaging materials can provide a chemical barrier. Biological protection provides a barrier to microorganisms (pathogens and spoiling agents), insects, rodents, and other animals, thereby preventing disease and spoilage. In addition, biological barriers maintain conditions to control senescence (ripening and aging). Such barriers function via a multiplicity of mechanisms, including preventing access to the product, preventing odor transmission, and maintaining the internal environment of the package. Physical protection shields food from mechanical damage and includes cushioning against the shock and vibration encountered during distribution. Typically developed from paperboard and corrugated materials, physical barriers resist impacts, abrasions, and crushing damage, so they are widely used as shipping containers and as packaging for delicate foods such as eggs and fresh fruits (Marsh, 2007). Since Green beans, Phaseolus vulgaris are one the important agriculture products, this article briefly aims at reviewing, its condition of production and packaging.

Phaseolus vulgaris, the green bean, is an herbaceous annual plant belonging to Fabaceae that originated in Central and South America. It is now cultivated in many parts of the
world for its beans, which can be harvested and eaten immature, still in the edible pod, or when mature, shelled and dried. Green beans, which are high in vitamin C and dietary fibers, carbohydrates, proteins, and minerals (Brigide et al., 2014), are occasionally served fresh in salads but are more often prepared as a cooked vegetable. Green beans are often sold canned or frozen. Dried beans from this species are harvested when the pods have fully matured and dried (Courteau, 2012).

The common dry bean or *Phaseolus vulgaris* L., is also the most important food legume for direct consumption in the world. Among major food crops, it has one of the highest levels of variation in growth habit, seed characteristics (size, shape, colour), maturity, and adaptation. It also has a tremendous variability (> 40,000 varieties). Germplasm collection in beans compares well with other important commodities on a worldwide basis. *Phaseolus vulgaris* is produced in a range of crop systems and environments in regions as diverse as Latin America, Africa, the Middle East, China, Europe, the United States, and Canada. The leading bean producer and consumer is Latin America, where beans are a traditional, significant food, especially in Brazil, Mexico, the Andean Zone, Central America, and the Caribbean (Jones, 1999).

Common bean is grown for its green leaves, green pods, and immature and/or dry seeds. The dry seeds of *P. vulgaris* are the ultimate economic part of the bean plant. They are appreciated throughout the developing world because they have a long storage life, good nutritional properties and can be easily stored and prepared for eating. Traditional markets have accentuated local preferences in seed colour and size of seed coat, but dry beans have similar composition. The different bean classes give identical total calories per gram. So it is easy to interchange or substitute different bean types within a major seed-coat class in recipes that require milling mashing or mixing. The consumer may not readily discern the bean type. There are some limits on the use of dry beans and research is finding ways to overcome them. The long preparation time can be inconvenient and expend much fuel. Changes in the product during post-harvest storage can damage the grain including seed hardening, hard shell, hardto-cook effect, moisture absorption, mould growth, seed discoloration, flavour and odour. Anti-nutrients such as protease inhibitors and lectins can block the digestion process. Factors promoting flatulence are another undesirable effect. Roasted beans can be pin-milled to produce whole flour or cracked by corrugated rollers for easy removal of hulls by air aspiration. Hulls may be ground as high fibre (40 percentages) flour to desired particle size (Sperling et al., 1996).

**PRODUCTION CONSIDERATIONS**

*Cultivar selection*. Snap beans are either pole (runner and half-runner) or bush types. Bush beans form compact plants 1 to 2 feet in height, while pole beans produce vines that may reach 8 to 10 feet in length. Half-runners have a growth habit between bush and runner, producing vines averaging 3 feet long. Typically, pole beans set pods over a longer period of time than bush beans. Pods of either type may have strings or be stringless; they may be round or flat in shape. While green is the most common color, pods may be yellow (wax beans), purple, or streaked (strang, 2011).

*Site selection and planting*. Snap beans grow best in well-drained soils with good water-holding capacity. They are sensitive to cold and even a slight frost can cause damage. For this reason, the first planting of beans should not be made until after the danger of the last killing frost in spring. Growers planning to mechanically harvest bush beans should plant varieties that produce a concentrated set of pods. Successive plantings every 2 to 3 weeks are desirable for fresh market sales (Strang, 2011).

Seeding rates are partly determined by variety; small-seeded varieties require fewer pounds per acre than large-seeded varieties. The average amount of seed to plant is about 80 pounds per acre. Seeds treated with fungicides and insecticides are recommended to improve
germination. Pole beans will require the construction of a trellis for support before the plants begin to produce runners. Snap beans need a continuous supply of moisture, especially during pod set and pod development. Some growers have reported extremely high yields and a cleaner harvest growing bush beans in raised beds with black plastic and drip irrigation. This has also been the case with trellised beans (Strang, 2011).

Pest management. Potential bean disease problems include seed rots, damping-off, bacterial blights, rust, anthracnose, and viruses. Following good cultural practices, growing resistant varieties when available, and purchasing western-grown treated seed can help in disease prevention. Fungicide/bactericide sprays may be needed in some years. Aphids, Mexican bean beetle, spider mites, and leafhoppers can cause losses if not controlled. Scouting to monitor populations can help the grower determine when and how often insecticides should be applied. Herbicides, cultivation, and a good rotation system can help control weeds (Strang, 2011).

Harvest. Snap beans are harvested at the optimum edible maturity stage when the seeds are about one-third developed. Half-runner and some other pole beans are harvested when the seeds are more developed. Many bush beans are mechanically harvested (once-over harvest). A pole bean crop is harvested an average of five times with each harvest three to five days apart. Beans for the fresh wholesale market are packed in bushel baskets or cartons. Several preservation methods including antioxidant treatments, modified atmosphere packaging (MAP), refrigeration, chlorine wash, ultraviolet irradiation-ray irradiation, chemical treatments such as with calcium chloride, citric acid, ascorbic acid are currently employed for commercial preparation of fresh-cut vegetables (Martin and Silva, 2003).

Green beans are generally harvested at a physiologically immature stage of development. Growth is rapid at the time of harvest and beans exhibit comparatively higher respiration rate, even when held at low temperatures. Cutting of green bean also accelerates respiration rate more than in intact beans. Therefore, the quality of fresh-cut green bean decreases rapidly. In order to prevent the loss of quality of fresh-cut vegetables, several treatment methods are being practiced and calcium chloride treatment is one (Martin and Silva, 2003).

REFERENCES

2. John Strang. 2011. Snap beans. Agriculture & Natural Resources • Family & Consumer Sciences • 4-H/Youth Development • Community & Economic Development