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A comprehensive industrialization of the processing of the pomegranate fruit The key to its economic viability

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Abstract. The past 10 years have witnessed major changes in the pomegranate industry. Specifically, a worldwide significant increase in the pomegranate planted area, an increase in fruit production, an increase in export quantities and an increase in the stored and processed fruit. Two factors are primarily responsible for these changes: (i) an increasing demand for the pomegranate fruit driven by a substantial body of published results of research on the characteristics of the pomegranate fruit, suggesting that the fruit has both, antioxidant and anti-inflammatory properties, helping reduce the risk of prostate cancer and artery plaque. And (ii), the unique development of a machine for automatic extraction of the arils, thus, facilitating the use of ready–to-eat arils and/or development of various postharvest processing lines, such as juice and wine production and development of various pharmaceutical and nutraceutical and cosmetic products derived from the arils kernels. While the current increase in fruit production continues and more "players" are joining in, there is no guarantee that the economic viability of the pomegranate industry is ensured. In fact, past experience have shown that if increased production is not matched by a similar increase in demand, prices of the fruit are liable to come down; competition will increase; small growers will be forced out of business and we shall witness (as seen in the past) uprooting of existing orchards with declined economy. The pomegranate industry is still undergoing a process of evolution from specialty to commercial crop. Thus, to ensure its sustained economy, a system approach has to be adopted addressing all the factors associated with the industrialization of the processing. Unfortunately, many growers do not even make use of existing technologies and do not initiate R&D to develop new processing technologies addressing the unique characteristics of the pomegranate fruit. Thus, for example, the arils extracting machine is yet not fully commercialized. Likewise, the unique freezing technology is still not fully utilized and very little is done to develop commercial products from the various components of the fruit, such as: the arils, the rind, the arils kernels and the juice. The potential is high, but unless a system approach is adopted, the fruit will remain a minor crop globally.

Keywords. Pomegranate – Arils – Processing – Freezing – Juicing.

I – Introduction

The past 10 years have witnessed major changes in the pomegranate industry. Specifically, a worldwide significant increase in the pomegranate planted area, an increase in fruit production, an increase in export quantities and an increase in the stored and processed fruit.

Two factors are primarily responsible for these changes. First, an increasing demand for the pomegranate fruit driven by a substantial body of published results of research on the characteristics of the pomegranate fruit, suggesting that the fruit has both, antioxidant and anti-inflammatory properties, helping reduce the risk of prostate cancer and decreasing artery plaque. The second factor is the development of a unique machine for automatic extraction of the arils, thus, facilitating the use of ready-to-eat arils and/or development of various postharvest processing lines, utilizing the arils as raw material for the production of quality juice

and wine and development of various pharmaceutical, food additives and cosmetic products derived from the arils kernels and the fruit's peel.

While the current increase in pomegranate production continues and more "players" are joining in, there is no guarantee that the economic viability of the pomegranate industry is ensured. In fact, past experience have shown that if increased production is not matched by a similar increase in demand, prices of the fruit are liable to come down; competition will increase; small growers will be forced out of business and we shall witness (as seen in the past) an uprooting of existing orchards with declined economy.

The pomegranate industry is still undergoing a process of evolution from specialty to commercial crop. Many potential consumers have not yet been exposed to this unique fruit and its many advantages. Yet, fruit production is increasing steadily, new orchards are being planted and yield per area is increasing through the introduction of better orchard management systems and introduction of new varieties, which provide almost a year around supply. Thus, to ensure the pomegranate sustained economy, and matching the growing supply with corresponding demand, a system approach has to be adopted addressing all the factors associated with the industrialization of the processing of the fruit. Unfortunately, many growers do not even make use of the existing technologies and do not initiate R&D to develop new processing technologies addressing the unique characteristics of the pomegranate fruit. Thus, for example, the arils extracting machine is yet not fully commercialized. Likewise, the unique freezing technology is still not fully utilized and very little is done to develop commercial products from the various components of the fruit, such as: the arils, the rind, the arils kernels and the juice. The potential is high, but unless a system approach is adopted, the fruit will remain a minor crop globally.

II – Proposed integrated scheme

The potential for the utilization of the pomegranate fruit illustrate schematically the complete processing possibilities of the pomegranate fruit (Fig. 1).

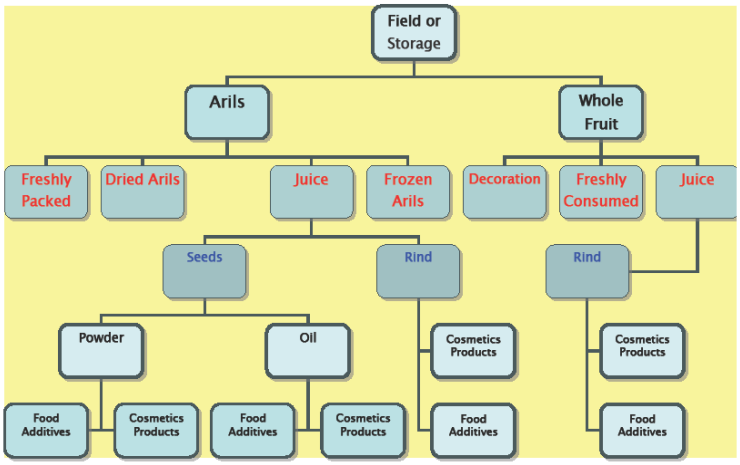

Fig. 1. Pomegranate fruit utilization scheme.

While the schematics portray a wide array of processing technologies, there are at present only three basic technologies which are partially used and are a far cry from a comprehensive processing scheme. These are the arils extraction technology, the frozen arils technology and

juice production. Thus, assuming that fruit production is going to increase in the foreseeable future, the only way to sustain the continued viability of the pomegranate industry is by increasing the demand for the fruit and its derivatives, the result of the various processing systems.

The current state of the art with the arils extraction technology is given in Fig. 2, that of the freezing technology in Fig. 3 and juice extraction in Fig. 4. These technologies are currently being used in 10 countries.

Unfortunately, all the other processing channels represent only a small fraction from the huge potential market in the food additives industry, medical products and the cosmetic industry. Thus, for sustained viability these additional processing channels need to be integrated into one cohesive processing scheme.

Fig. 2. Arils extraction technology: A patented principle of operation (i) Current Field Capacity: up to 56 fruits per minute; (ii) Operates in 10 countries with over 30 installations.

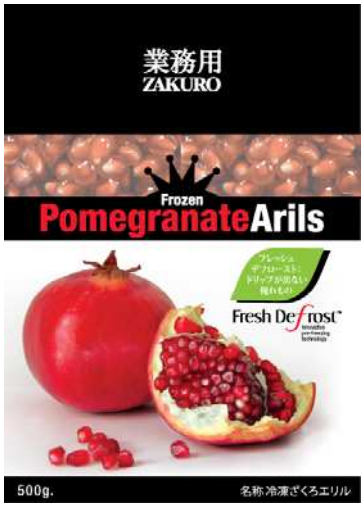

Fig. 3. Frozen aril technology: (i) Keep the nutrition as of fresh; (ii) Available all year round.

Fig. 4. Juicing technology. High-quality juice through extracted arils technology: (i) No bitter taste; (ii) Easy to consume; (iii) Can be frozen and de frozen without being concentrate; (iv) Available all year.

III – Conclusions

The pomegranate fruit has a tremendous potential, based on its unique characteristics. The awareness of its many advantages has led to a dramatic increase in its production worldwide – a trend which continues even at present. However, if this trend will not be matched up by a similar increase in the demand, the viability of this industry is likely to witness a major setback. Thus, only a concerted effort to integrate all factors associated with the processing of the fruit would ensure the viability of this industry. The technologies are already available and it is now a matter of implementing the various technologies.