OCTOBER | 2024 | SPECIAL ISSUE

MEASURING IMPACT

Quantifying the Benefits of In-Plant Extended Shelf Life (ESL) on Profitability from Grower to Supermarket

Non-GMO, Non-Chemical, Non-Pesticides

A Cellular Regeneration Biotech with HQ in Singapore

Official Website: www.ibiostim.com

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HORTI "PROFITS"

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Fieldwork by ChongMing

DEFINITION OF ESL & ITS IMPORTANCE

Extended Shelf Life (ESL) refers to the various methods and technologies used to prolong the freshness and usability of food products beyond their typical shelf life. This is achieved through advanced packaging, processing, and preservation techniques that slow down spoilage and maintain the quality of the food. ESL technologies play a crucial role in reducing food waste by keeping products safe and appealing for longer periods, addressing a significant global issue. They offer economic benefits by minimizing spoilage losses, thus enhancing profitability for all stakeholders in the supply chain, from growers to retailers. ESL also improves supply chain efficiency by allowing more flexible logistics and inventory

management, enabling products to be transported over greater distances and stored longer without compromising quality. Additionally, ESL ensures consumers have access to fresh, high-quality products for extended periods, enhancing their shopping experience and satisfaction. Furthermore, ESL enables producers to reach new markets that were previously inaccessible due to the perishable nature of their products.

In this SPECIAL ISSUE, we measure the impact of ESL on profitability across the entire supply chain by using in-plant preservation as nature's tool, by peering through the lens of a major hypermart with everything being equal. It aims to analyze how ESL reduces post-harvest losses, improves logistics and inventory management, enhances consumer satisfaction, and opens up new market opportunities. By examining these factors, this SPECIAL ISSUE will provide a comprehensive understanding of the economic benefits of in-plant preservation as an existing ESL technology and its role in boosting the efficiency and profitability of the food supply chain.

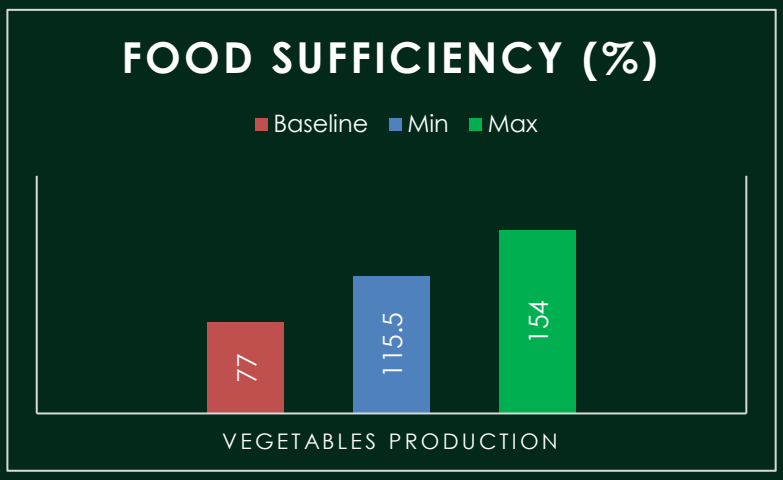
IMPACT ON GROWERS

Reduced Waste - ESL play a significant role in reducing post-harvest losses for growers. By extending the period during which produce remains fresh and safe to consume, ESL helps minimize the amount of food that spoils before it reaches the market. This reduction in waste translates to higher yields, as more of the harvested produce can be sold rather than discarded. Consequently, growers can achieve better returns on their investments, as they are able to sell a larger proportion of their crops. This not only boosts their profitability but also contributes to more sustainable agricultural practices by making the most of the resources used in farming.

Market Access - Longer shelf life opens up new market opportunities for growers. With extended freshness, produce can be transported over longer distances without compromising quality, allowing growers to reach markets that were previously inaccessible due to the perishable nature of their products. This expanded market access means that growers can sell their produce in regions with

IMPACT ON GROWERS, DISTRIBUTORS AND RETAILORS

Fieldwork by ChongMing



higher demand or better prices, further enhancing their profitability. Additionally, the ability to access distant markets can help stabilize prices and reduce the impact of local market fluctuations, providing growers with more consistent and reliable income streams.

IMPACT ON DISTRIBUTORS

Logistics and Storage – ESL offer significant benefits in logistics and storage for distributors. By prolonging the freshness of products, ESL reduces the urgency for rapid transportation, allowing for more flexible and cost-effective shipping schedules. This means that distributors can consolidate shipments, reducing the frequency of deliveries and optimizing transportation routes. As a result, transportation costs are lowered, and the environmental impact is minimized due to fewer trips. Additionally, with products remaining fresh for longer periods, there is less pressure to move goods quickly, which can lead to better planning and utilization of storage facilities.

Inventory Management - ESL also enhance inventory management by improving inventory turnover and reducing the risk of spoilage. With longer shelf life, distributors can maintain larger inventories without the fear of products expiring before they are sold. This leads to more efficient stock management, as products can be stored for extended periods without compromising quality.

Improved inventory turnover means that products are sold and replenished more effectively, reducing the likelihood of overstocking or stockouts. Furthermore, the reduced risk of spoilage translates to fewer losses and write-offs, contributing to better financial performance and more reliable supply chains.

IMPACT ON RETAILORS

Stock Availability - ESL is crucial for supermarkets in maintaining consistent stock levels. By prolonging the freshness of products, ESL reduces the frequency of out-of-stock situations. This means that supermarkets can keep shelves stocked with fresh products for longer periods, ensuring that customers always find what they need. Consistent stock availability not only enhances customer satisfaction but also builds customer loyalty, as shoppers are more likely to return to a store where they can reliably find fresh, high-quality products. Additionally, better stock management reduces the need for emergency restocking, which can be costly and disruptive.

Reduced Discounting - One of the significant benefits of ESL for retailers is the reduction in the need to discount near-expiry products. With longer shelf life, products remain sellable for extended periods, decreasing the urgency to sell them off quickly at reduced prices. This helps supermarkets maintain their profit margins, as they can sell products at full price for a longer duration. Reduced discounting also means less financial loss due to markdowns and less waste from unsold expired products. Overall, this contributes to a healthier bottom line and more efficient inventory management.

ECONOMIC ANALYSIS

In the previous SPECIAL ISSUE Mission Impossible, we discussed and showed the benefits of in-plant preservation as an indispensable ESL tool equipping berry growers with the power of negotiation in their favour by extending shelf life for another 5 to 14 days (chill). In this SPECIAL ISSUE, we use a case study adapted from an actual country in the Middle-East, built around a hypermart with a market penetration of between 20-25% for various fruits and vegetables. Information was retrieved from official Department of Statistics for various fresh produce on a annual basis, with official statistics from the anonymised hypermart in the public domain. The intention is to evaluate the impact of iBioStim™ on local production, as well as how the ESL arising from the use of iBioStim™ ESL Biotech converting into higher income bracket for the hypermart, by taking into consideration factors including

- Reduction in Waste (A),
- Extended Sales Period (B),
- Increased Sales Window (C),
- Logistics Savings (D), &
- Customer Retention (E)

For the purpose of this SPECIAL ISSUE, we offer two perspectives led by a TOP-DOWN Food Security and Food Sufficiency evaluation, followed by evaluation through the hypermart projected annual termsheets.

Scope of Fresh Produce – Includes tomatoes, cucumbers, eggplants, green peppers, cauliflower, cabbages, bananas and papayas (according to official data repository).

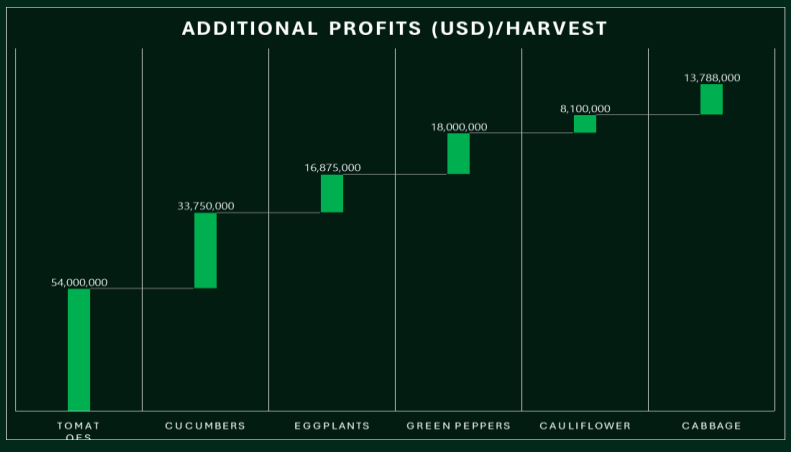
Calculations – Two sets of values were used for estimation of annual revenue and profits, namely wholesale price and retail price in USD currencies. Wholesale price is used for evaluation of economic impact while retail price is used for evaluation of profitability at retail chain level.

Financial Model – Using existing annual production as baseline, we constructed a simplified Linear Discriminant Analaysis (LDA) Model to quantify the benefits of post iBioStim™ farming intervention at country level, followed by an adaptation with iBioStim™ ESL Biotech in operation in the retail chain.

Correction Factors – LDA models for retail chain is corrected for 20-25% market penetration using estimated retail prices for various vegetables.

Climate Model – Topical growing conditions, with commercial chilling conditions as yardstick for storage.

Assumptions – Existing food spoilage (A) determined as 40%, with post intervention target as 5%, (B) and (C) as a normalized factor of 0.43, (D) as a normalized factor of 0.08, and (E) as normalized factor of 0.02.



RESULTS & DISCUSSION

The application of an integrated iBioStim™ regime is expected to uplift national vegetable production capacity from 77% to between 115.5% to 154%, exceeding Food Sufficiency Goal of the Kingdom. In terms of additional profits per harvest, that translated into USD 8.1M to USD 54M per annum, on a total sum of USD 144M to USD 525M, with tomato production leading profitability, followed by cucumber.

In the retail sector, an expected rise in profitability is forecasted, ranging from USD 1.5M to USD 22.5M for respective vegetable categories, amounting to a total additional income of between USD 55M to USD 223M per annum. With ESL now activated, we expect these numbers to rise to USD 106M to USD 422M year on year.

Clearly, the compounding effects of integrating iBioStim™ regime + iBioStim™ ESL capability provided a significant improvement to the profitability of the retail sector, representing 73.4% of the total economy (additional profits) of the vegetable production in the Kingdom.

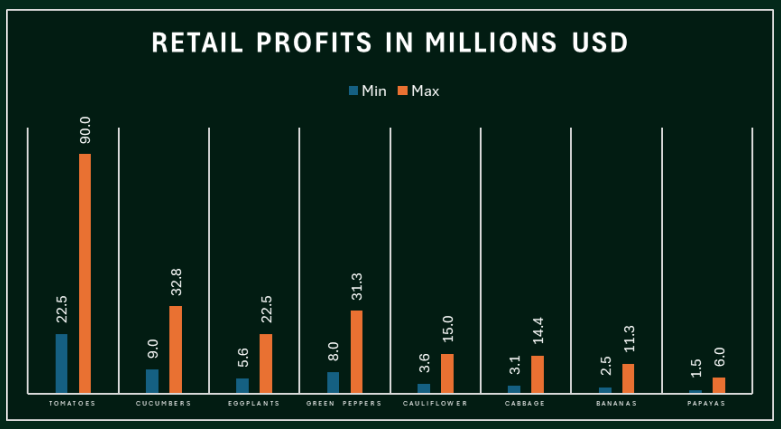
Against the backdrop of combined GDP (agriculture, forestry and fishing) at USD 2.11B in year 2022, the corresponding increase in profitability from the retail sector alone for vegetables represents a 20% increase in total income.

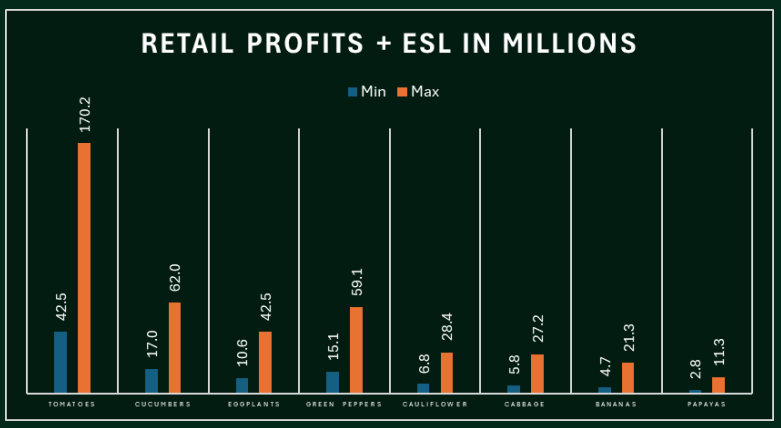
CONCLUSION

The economic impact due to the implementation of iBioStim™ and its corresponding ESL biotechnology represent a significant uplifting power to increase profitability across the entire value chain through its retail channel by a remarkable 20% of the Kingdom total GDP for agriculture, forestry and fishing combined, amounting to a maximum forecasted value of USD422M on the vegetable sector alone.

On its own, ESL doubled the income bracket of various vegetable categories through the retail sector, consolidating its important position in the National Food Security Roadmap of the Kingdom.

A powerful economic tool becomes available, meeting Food Security & Food Sufficiency needs of the Kingdom.





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