

**CASE STUDY****Fruit Bars Handling Systems**

Component: a range of fruit bars

Industry sector: Food

Performance: Automatically load customers carton machine in-feed conveyor at 80 fruit bars per minute total

**Introduction**

Product packaging is a critical item for any food processing company; it is used as a marketing tool and also serves its main function of sealing the product for transportation and shelf life

Traditionally food processing companies have utilised manually loaded wrapping and sealing machines, especially for flexible packets such as cereal or fruit bars. Manually loaded machines although flexible are labour intensive, slow and costly.

The recent demand and move towards flexible packaging helps towards material savings and the products carbon footprint but also complicates automated machinery. Flexible packaging in the main is non-uniform and difficult to handle due to its inconsistency

A global leader in the snack food industry approached RNA to develop a system that could accurately and consistently load fruit bars into a process line. The existing machinery was manually loaded by multiple operators into flighted pockets on an in feed conveyor.

Three types of fruit bars were required to be automatically handled, Fruit Smoothie Bars (25g), Fit Stix (20g), elongated shape Humzingers (5 flavor varieties). (Figure 1)

**The Challenge**

A major consideration in this application was the nature of products: inconsistent in shape due to the packaging wrapped around a typically soft chewy bar. The challenge was going to be ensuring products were in the correct position for loading onto the customer's indexing conveyors, where each index requires up to 10 products per index. The proposed loading speed dictated a solution using a minimum of five bowl feed systems. There came with another challenge that was balancing the feed from each bowl feed system and loading the products into flighted pocket two at a time. The edges of the wrapper overlapped and could tangle if not separated by the RNA system.

Additionally, the customer required a complete automation-friendly system, with the minimum requirements below:

1. Each feed system to be used independently
2. In the future the system can be used for other products
3. Each feed system can be removed from the main conveyor via pluggable, quick released connection.
4. The in feed conveyor belts to be designed open and accessible from all sides by an operator

**Solution**

The variants of fruit bars and the loading speed required a minimum of five bowl feed systems. The request was to feed 80 fruit bars per minute total from each bowl to give a machine loading speed of 40 cycles per minute with 2 bars per cycle. Fruit bars are loaded by operators into bulk hopper. They were discharged end to end from the bowl to a transfer conveyor which connected a cross conveyor which queued the fruit bars prior to loading.

An escapement released fruit bars on demand into a side shuttle which pushed them into the customer's bucket. The customer's conveyor indexes and the cycle repeats.

Sensors controlled the flow of products through the system re-circulating over feed and also checking that the fruit bars were separated correctly at all time. The whole system is controlled by a PLC which communicate with the customer's machine PLC.

Fruit bars loading rate and performance rate were dependant on types of product and bucket designs: 5 bowl feeders were required to work with a 5-column bucket for Humzingers, performing at 400 bars per minute, while 3 bowl feeders were required to work with a 3-column bucket for Fruit Smoothie Bars and Fit Stix.

The system is automation-friendly, providing a complete automation solution allowing both high throughput and flexibility. As well as performing fruit bars loading at maximum rates of 400 bars per minute, the system also achieve a high level efficiency. The system offer the customers, not only cost-saving benefits such as labour cost savings and the production speed required, but also additional incremental benefits such as increase in capacity, reduced downtime, improve quality, raised standards of health & safety and better hygiene standard for food products, which deliver an enhanced return on the investment.

**Key features & benefits**

- A Flexible and cost effective system
- Each feeding module can be used independently as required
- High level of efficiency and reliability
- High loading speed
- Open operator accessibility during operation

All of these benefits deliver a short payback period and impressive return on investment.

