Challenges Faced by Food Industry in India wrt. Loss/Damage due to uncontrolled Humidity

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The Food industry, especially the processed food segment in India is facing many challenges. Currently, increased pressure on raw material cost, food safety, quality and hygiene, excessive wastages, poor product shelf life, shortage of skilled manpower are some of the most frequent problems faced by the industry.

India, as we know, is the world’s second largest producer of food next to China, and has the potential of becoming the biggest. As per industry reports, the total food production in India is likely to double in the next ten years and there is a growing opportunity for very large investments in food and food processing technologies, skills and equipment, especially in areas of Canning, Dairy and Food Processing, Specialty Processing, Packaging, Frozen Foods/Refrigeration and Thermo Processing, Fruits & Vegetables, Fisheries, Milk & Milk Products, Meat & Poultry, Packaged/Convenience Foods, Alcoholic Beverages & Soft Drinks and Grains are important sub-sectors of the food processing industry. Health food is another segment which is rapidly growing.

The Indian food industry is estimated at over US$ 182 billion, and which is predicted to grow to US$ 400 billion by 2025.

The food processing industry is said to be growing at 14 per cent against 6-7 per cent growth in 2003-04. The industry received foreign direct investments (FDI) totaling US$ 143.80 million in 2007-08 against US$ 7.70 million in the previous fiscal. The cumulative FDI received by the industry from April 2000-January 2009 stood at US$ 790.32 million.

With the growth comes the technology challenges. As the food industry incorporates more sophisticated technologies to maintain the growth fuelled by changing consumer tastes and lifestyles, every processor is endeavoring to ensure that the food product reaches the consumer with the right flavor, perfect shape as well as has a long shelf life.

Food safety is, probably, one of the most important issues that food companies face day-in and day-out. Concern for public health in the case of potentially devastating consequences of contaminated food has driven industry associations, safety experts and watchdog organizations to establish guidelines not only for food handling, but for plant and process line design. Following these recommendations can reduce the possibility of a catastrophe. Microorganism growth is one of the main causes of potential food contamination. Moisture results in increased microorganism growth. Microbial growth and dispersal can be controlled if the food processing facility is kept dry. But keeping a plant dry is not easy as water is an essential part of product and process of food processing. Ensuring the correct moisture and condensation levels for food production is crucial.

Water or moisture greatly affects the keeping qualities of food. Excessive moisture pickup can result in product spoilage and spoilage by:

- Microorganisms — microorganisms need water to dissolve the food they consume. Water allows the food to get into bacteria, yeast and mold cells where it is used for energy and growth.
- Chemical Reactions — the moisture in the food also causes chemical reactions to occur between components in the product.

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frequent breakdowns in the conveyor drive mechanism. To ensure free flow of powder and avoid sticking of powder on chain conveyor and other machine parts, Relative Humidity (RH) in the packing hall has to be maintained at 40 ± 5% and temperature at 22-25°C. The solution to the problem lies in the introduction of a dehumidifier. The dehumidifier by pegulating the relative humidity in the environment provides the most simple and economic solution to overcome lumping and caking. It also avoids the sticking of powder on packing machines, hoppers, and other parts. Moreover, it ensures an easy, free flow of powder through the packing machine into containers.

Spray / Fluidized Bed dryers require large quantities of hot air for drying. The quality of the final product is affected by the quality of air entering the dryer. It should be dry, free from contamination, foreign particles and odourless. With the growing emphasis on limiting production losses and downtime, which impacts final product quality and thus profits, the importance of using dehumidifiers, in conjunction with Spray Dryer / Fluidized Bed Dryer for quality drying, has become almost mandatory.

Moisture hinders the free flow of powders/ granulas making many downstream operations (e.g. packaging, filtering, handling) difficult and expensive. In Meat Processing, condensation can "seep" into your profits. Water vapours released during slaughtering and processing, cooking processes and temperature differentials contribute to moisture buildup inside a plant. Preventing fog and condensation build-up by controlling the room temperature and humidity retards microbial growth. Controlling condensation by ensuring management of moisture levels is now an accepted engineered solution as Air conditioning usually is not sufficient to eliminate condensation. Compared to the typical refrigeration system, desiccants are effective in removing moisture from the air without condensing or at extremely low temperatures.

Food safety scares in the Western world, specially the US and Europe has drawn food processors’ attention to desiccant dehumidification systems, which ensure the right levels of humidity within food production facilities.