Rapid advancements in technology have allowed its use to encompass many aspects of industries throughout the world. Being a crutch for human survival, the food industry has taken full advantage of technology in order to improve processing, packaging, and the overall safety of consumer foods (Martin, Nicole). What roles will technology take over in processing and packaging, and how important is technology to these industries?

The use of robotic systems ranges from seeding, spraying water, harvesting, cutting, processing, and packaging of meal products. Additionally, robots are utilized in the processing of meat and automatic quality detection for the final product of bakery items. By using robotic machines, bottles in the beverage industry are also cleaned, counted, filled, and arranged on conveyor belts automatically. Furthermore, modern vision systems are used by high-definition cameras for defect detection and inspection using robot learning techniques (Iqbal, Jamshed, et al.). Using AI integration can further expand the knowledge and accuracy that a robot is capable of. By implementing robotics, manufacturers of food have been able to increase their productivity by 25% as compared to human labor. Recent trends show that in future industries, automatic robots are a necessity for addressing competitive challenges and meeting the needs of an ever-growing population (Lambertini, Marco).

Packaging plays a crucial role in protecting food products from environmental, chemical, and physical challenges. It can be as simple as preventing breakage of the product or as complex as providing a barrier against moisture, oxygen, carbon dioxide, and other gases as well as flavors and odors (Abdullahi, Nura). Packaging serves as both passive protection and also an active method of maintaining the desired atmosphere around a product to ensure the highest quality and freshness. Recently, a study at Harvard has unveiled the possibility for edible packaging in the future to combat pollution. As we learn more about global warming and the degradation of the planet, it is imperative that larger companies try to implement this technology to help combat the negative effects of larger waste amounts. Furthermore, research by Texas A&M University and the pharmaceutical company Bayer have revealed a new packaging material called “micro-film”. This material is 1000 times thinner than human hair and does a better job at preserving foods and beverages than what is available on the market (Nichols, Megan Ray). Advancements in technology continue to help improve the freshness and quality of foods while also making the resources used more sustainable and less harmful to the planet.

As demands grow due to a rising population, food processing has had to undergo a revival through the use of technology. The adoption of newer and evolving tech allows for streamlined processes, smarter and more efficient industries, and an overall boost to their output. Arguably the most important new innovation is the ability for complete automation in the processing of foods. As of 2017, 73% of all companies said they are either implementing or engineering complete automation for their facilities (Nichols, Megan Ray). Systems are designed to perform repetitive tasks faster and with greater accuracy, thereby improving output without harming quality. It's not just about hardware, like switching from a human to a robot. It can also be achieved through software. AI and robotics are two different forms of technology, but when paired become the ultimate worker. AI helps robots become more precise, intelligent, and aware by feeding them the data they digest. Most robots can only perform repetitive, clearly defined tasks on their own, but when you add complexities, the robot will often fail. In contrast, when governed by data-based intelligence systems such as artificial intelligence or machine learning, those robots become truly extraordinary.

Though the future of technology is unknown, it is safe to assume that it will reach capabilities once thought impossible. The future of food processing and packaging future is going to increase substantially with the ever-increasing population. In order to avoid hungry people and a shortage of food, technology will need to become the frontrunner for the food processing and packaging industry. By pairing multiple technologies together, an industry of unprecedented efficiency will fruition.

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