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New machine enriches vitamin D in mushrooms

Collaboration between UK firm JenAct and Xenon of the US sees breakthrough that promises major boost to mushrooms

A new machine has been unveiled for enriching mushrooms with vitamin D within a food processing environment.

Hampshire-based JenAct has worked with US firm Xenon Corporation's pulsed light system to create the new machine, which aims to tap into the fact that mushrooms are relatively unique in being capable of having their vitamin D content artificially enhanced.

100g of sun-grown mushrooms contain around 10 per cent of the recommended daily allowance (RDA) of vitamin D, but JenAct says almost all commercially grown mushrooms contain only about one to two per cent of RDA. However, by exposing them to UV light this can be increased to more than 200 per cent.

Xenon had been working on a system for enhancing vitamin D levels in mushrooms, and although successful was only suitable for use in laboratories. Based on the process approved by the

FDA and the EU, JenAct has further developed the technology for the food production environment.

Xenon's pulsed lamps, which generate the high intensity UV light, can achieve the desired Vitamin D levels in fresh mushrooms within a few seconds. However, the pulsed UV systems must be carefully controlled and well integrated into the machine otherwise they can pose significant health and safety risks.

To achieve the correct UV dose for the mushrooms, it was necessary to ensure that a defined UV light energy was applied to every punnet. This required careful design of the UV treatment zone to ensure that uniform UV light reached the final irradiated product while reducing light leakage to almost zero.

A machine control strategy was implemented using a state-of-the-art PLC hardware solution with the software implemented in C++, the company explained. Since safety was

paramount, a hardware safety strategy with multi-level redundancy was at the heart of the system using some of the latest safety relays and control hardware available.

JenAct said its machine has been designed to minimise pulsed light leakage for the protection of operators. Produced from stainless steel, it allows standard punnets of mushrooms to be either automatically of manually loaded and fit within the normal dimensional confines of the food processing environment.

Capable of operating continuously on a multi-shift basis, JenAct's UV system requires minimal operator intervention for maximum production uptime. In addition, the UV dose delivered to each punnet of mushrooms is consistent and easily verifiable.

JenAct director Dr Jaromir Bilek said: "This truly multidisciplinary project required in-depth understanding and

knowledge not only from the food processing and UV industry, but also expertise in automation, electronics, radiometry and high-voltage circuits. With so many important and competing technical and financial factors, it was probably one of

the most complex projects ever carried out within the Jenton Group's 40+ year history.

"In order for it to be a success it required taking a relatively fragile piece of technology and creating a robust and

easy-to-use machine, requiring the level training associated with, for example, a metal detector or checkweigher."