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BENEFITS OF *BACILLUS SUBTILIS* QST 713 TREATMENT IN TOMATO PLANT PRODUCTIVITY AND DEFENCE

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World population is projected to reach 9 billion by 2050. In this context, in addition to challenges, such as education equity and environmental resources consumption, poverty and malnutrition will be addressed first of all. To ensure correct nutrition, respecting the environmental conditions, application of biocontrol agents (BCAs) represents a good solution. BCAs can be used to provide systemic resistance against plant pathogens, thus allowing increased productivity and quality of crop. Yield loss and plant death represent the last stage of disease caused by Cucumber mosaic virus Fry (CMV) in tomato host. Among BCAs, *Bacillus spp.* are typical plant growth promoting rhizobacteria (PGPR). To investigate the effects of BCA in healthy and inoculated with CMV tomato plant, on fruit characteristics and against CMV infection, *Bacillus subtilis* QST 713 was chosen. Productive and qualitative parameters as quantity, weight and diameter

as well as lutein and beta-carotene contents in tomato fruits were estimated. Obtained outcomes show that plants treated with *Bacillus subtilis* QST 713, though inoculated with CMV, produced more, heavier and bigger fruits than untreated plants. Furthermore, the contents of lutein and beta-carotene are highest in the same fruits. Moreover, ELISA results indicate that the viral load is controlled by bacterial strain used. Chromatographic analyses of nutraceuticals such as polyphenols and vitamins are in progress.

To conclude, application of *Bacillus subtilis* QST 713 as biocontrol agent performs a powerful approach to increase food availability providing also antioxidants-rich fruits in response to growing population, protecting the natural resources and preserving the environmental sustainability.