

**ASSESSING THE EFFICACY OF PROBIOTICS IN
NANOPARTICLE PRODUCTION WITH FUNCTIONAL
PROPERTIES**

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I.D. No. MTM 12005

*Thesis submitted in partial fulfillment of the
requirements for the degree of*

MASTER OF TECHNOLOGY

in

FOOD TECHNOLOGY

to

TAMIL NADU VETERINARY AND ANIMAL SCIENCES

UNIVERSITY

CHENNAI – 600 051

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CHENNAI – 600 052

2014

**TAMIL NADU VETERINARY AND ANIMAL SCIENCES UNIVERSITY
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CERTIFICATE

This is to certify that the thesis entitled “**ASSESSING THE EFFICACY OF PROBIOTICS IN NANOPARTICLE PRODUCTION WITH FUNCTIONAL PROPERTIES**” submitted in partial fulfillment of requirements for the degree of **Master of Technology in Food Technology** to the **Tamil Nadu Veterinary and Animal Sciences University, Chennai - 51**, is a record of bonafide research work carried out by **Ms.VAISHNAVI.A.S**, under my supervision and guidance and that no part of this thesis has been submitted for the award of any other degree, diploma, fellowship or other similar titles or prizes and that the work has not been published in part or full in any scientific or popular journal or magazine.

Date : 25.06.14
Place : Chennai -52


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CHAIRMAN

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Date : 03/08/14
Place : Chennai


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Date : 14.8.14
Place : Chennai-52

ABSTRACT

Title : ASSESSING THE EFFICACY OF PROBIOTICS IN NANOPARTICLE PRODUCTION WITH FUNCTIONAL PROPERTIES

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Whey, a by-product of paneer industry, goes as waste and pollutes the environment. By using probiotic bacterial cultures (*Lactobacillus acidophilus* and *Bifidobacterium bifidum*) and whey as the medium of growth, NaHSeO₃ as selenium source, a study on elemental SeNPs production was assessed. So that the current study aims at the effective utilization of whey for the production of nanoselenium. Citric acid and Acetic acid were used for acidification of milk and further production of whey. Whey was prepared at different levels of acidification (1, 1.5 and 2%). Acetic acid at 2% level showed the better results while comparing the others. Whey media was modified with whey protein concentrate (WPC 97) at 2.5% (P₁), 3.5% (P₂) and 4.5% (P) for the better growth of bifidobacteria and lactobacillus as well for augmenting the production of selenium nanoparticles. As the selenium source, Sodium Hydrogen Selenite (NaHSeO₃) was used at varying concentrations of 5mM (S₁), 10mM (S₂) and 15mM (S₃) levels. The colour change of whey from greenish yellow to cherry red indicated the formation of nanoparticle production. The pH changes indicated the better activity of cultures and increased elemental nano production. Further confirmation of nanoparticles was done by UV spectrophotometer. Maximum absorbance (λ_{max}) was reached at 280nm. The UV spectrometry revealed increase in absorbance with increased WPC% from P₁ to P and NaHSeO₃ from S₁ to S₃ addition. The antimicrobial property of the synthesized selenium nanoparticle was determined by using well diffusion method against *E. Coli* microorganism and the zone of inhibition was measured about 21.22±0.09 for LaPS₃ and 21.17±0.07 for BbPS₃. The size of the produced nanoparticle were analysed by using Transmission Electron Microscope TEM. The mean value of the SeNPs of LaP₁S₁, LaP₁S₁, BbP₁S₁ and BbPS₃ ranged from 28.92nm, 115.004 nm, 93.758 nm and 132.74nm.