Fiscal Year:	FY 2009	**Task Last Updated:**	FY 09/21/2009
PI Name:	Perchonok, Michele Ph.D.		
Project Title:	Effect of space radiation on the nutrition and quality of the food		
Division Name:	Human Research		
Program/Discipline:	HUMAN RESEARCH		
Program/Discipline--Element/Subdiscipline:	HUMAN RESEARCH--Space Human Factors Engineering		
Joint Agency Name:		**TechPort:**	No
Human Research Program Elements:	(1) **SHFH**:Space Human Factors & Habitability (archival in 2017)		
Human Research Program Risks:	None		
Space Biology Element:	None		
Space Biology Cross-Element Discipline:	None		
Space Biology Special Category:	None		
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City:	Houston	**State:**	TX
Zip Code:	77058	**Congressional District:**	22
Comments:			
Project Type:	Ground	**Solicitation / Funding Source:**	Directed Research
Start Date:	10/01/2007	**End Date:**	08/31/2009
No. of Post Docs:		**No. of PhD Degrees:**	
No. of PhD Candidates:	1	**No. of Master' Degrees:**	
No. of Master's Candidates:		**No. of Bachelor's Degrees:**	
No. of Bachelor's Candidates:		**Monitoring Center:**	NASA JSC
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Flight Program:			
Flight Assignment:			
Key Personnel Changes/Previous PI:			
COI Name (Institution):			
Grant/Contract No.:			
Performance Goal No.:			
Performance Goal Text:			
Task Description:	It is vital that food sent up into space for long durations maintain its nutritional and sensorial quality throughout the length of the mission. One major source of nutritional and sensorial quality loss during a long duration mission is ionizing radiation. Ionizing radiation has been used as a food safety aid for over a century now and research supports its effectiveness in reducing numbers of foodborne pathogens, extending shelf life and controlling pests. Most of these studies have used gamma rays (mostly from Cobalt-60, but also Cesium-137), high-energy electrons/electron beans or x-rays. This radiation has been applied mostly on the kiloGray doses since these levels provide the most microbial lethality. There is considerably less research available that studies the effects of low-dose radiation on the properties of food. NASA radiation experts estimate that on a 30 month mission to Mars, food will come in contact with no more than 5Gy of radiation. This objective of this study was to perform a literature search on effects of low dose radiation on food quality. Much of what is published in the literature uses doses considerably higher than 5Gy and it can be assumed if		

	there is no significant difference of radiation at the kiloGray level, on certain components or properties of food, there will be no noted difference in these attributes at lower doses.
Rationale for HRP Directed Research:	
Research Impact/Earth Benefits:	
Task Progress:	This objective of this study was to perform a literature search on effects of low dose radiation on food quality. Much of what is published in the literature uses doses considerably higher than 5Gy and it can be assumed if there is no significant difference of radiation at the kiloGray level, on certain components or properties of food, there will be no noted difference in these attributes at lower doses. Overall, it is safe to say that radiation encountered at doses typical for a Mars mission is not prohibitively high to render the food supply inadequate given than space radiation at equivalent doses acts like gamma or electron bean radiation sources. However, research would be necessary to understand how actual space radiation, not just electron or gamma radiation, affects food in order to better predict and prepare countermeasures to these effects. Currently, there are no studies that have examined the effects of space radiation on food or how this type of radiation differs from more conventional types used for safety.
Bibliography Type:	Description: (Last Updated: 01/30/2012)