## QUARTERLY PHYSICAL REPORT OF OPERATION

as of 4th Quarter 2021

Department	DEPARTMENT OF SCIENCE AND TECHNOLOGY	X	Current Year Appropriations
Agency	INDUSTRIAL TECHNOLOGY DEVELOPMENT INSTITUTE		Supplemental Appropriations
Operating Unit			Continuing Appropriations
Organization Code	190050000000		Off-Budget Account

			Phy	sical Targe	ts			Physical	Accomplishme	nts			0
Particulars	CODE	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	Variance as of Q4	Remarks
111	2	3	4	5	6	7	8	9	10	11	12	13	14
Industrial Technology R&D Program Outcome Indicators 1. Number of partnerships with public and private stakeholders and international organizations												+24	Q4 2021: 2 signed MOAs:  1. DOST-NCR (Contract R&D, Waste Analysis and Characterization Study (WACS) in Public Markets: Support to the Effective Solid Waste Management Program of Selected Public Markets in Manila).  2. DOST RO III (Technical Assistance, Deployment of Drinking Water Treatment System for Selected Indigenous People (IP) Communities in the Province of Tarlac)  Q3 2021: 14 signed MOAs/MOUs  1. DOE-EUMB (Technical Collaboration, Establishment of Fuel C R&D and Testing Facility)  2-4. Vision College of Jeonju, LSPU, and PUP-Biñan (Technic Collaboration, Cooperation on academic and educational exchanges)  5-7. Finite Element Institute of the Philippines, FEATI, and National University (Technical Collaboration, Promotion of Finite Element Analysis (FEA) in the Academe and Industry)  8. Philippine Army (Project Cooperation, Field testing of Food ration during combat operations)  9. Bostfriend Goodies (Licensing agreement, Dev't and field testing of shelf stable RTE chicken arroz caldo as relief food)  10-12. Sapang Multi-Purpose Cooperative, DOST III, and Tarla Agricultural Univ. (Project cooperation, Upgrading the capability of distribution centers/ trading posts in the deliver of fresh and semi-processed agricultural products)  13-14. DSWD 4A and DOST 4A (Project cooperation, Development of Three (3) New Disaster Relief Foods for Vulnerable Groups  Q2 2021:  1. DM Wenceslao and Associates (Contract R&D: Bench Scal Fluidized Bed Gasification (FBG) of Lignite Coal for Indirect Coal Liquefaction)  2-3. Ms. Raphie Armat and Ms. Hannah Laya Resurreccion (Project Cooperator: Thermal Process Validation of
													Traditional and Ethnic Bottled Products- Acidified-Pasteuri Vegetables 4. Kasama HALAL Cooperative (Project cooperator for ongoing GIA project Development of Emulsified Meat Products) 5-6. Mr. Jojo L. Aquino and Mr. Alvin Causing (Project cooperation: Establishment of Halal assurance System for Selected food Ingredients)

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Particulars	UACS	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	Variance as of Q4	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14
Number of partnerships with public and private stakeholders and international organizations (Cont.)													7. Kim Bagundang (Project cooperator: Development of Halal Compliant Dehydrated Food Products)  8. Dr. Dave Centeno (Technical Collaboration/ Market Research: Bench-scale Production, Safety Assessment and Market Research of Halal Cosmetics and Tolletries)  9. DOST Reg. II (Training and Consultancy on Lab Quality Management System: Compliance to PNS ISO/IEC 17025:2017 o DOST-II RSTL)  10. Palaya Corporation (Technical Service: Evaluation of Bactericidal Activity of Ozein OZ-500 Ozone Air Purifier Model AP500.SD as Water Purifier Against E. coli and K. aerogenes 11. PUP Manila (Technical Service: Physico-chem Analysis and Anti-Microbial Activity Test for the 70% Alcohol Solution with Virgin Coconut Oil)  11. 2021:  12. Fruit Magic and DOST-NCR (Ongoing PCIEERD Project: Development of a Compact Wastewater Treatment System for Restaurants and MSMEs Discharging to Manila Bay)  3-6. Orich International Traders, Fenor Foods, Bagundang Enterprises, and PCIEERD (Project cooperator for the PCIEERD Project: Development of Halal Compliant Dehydrated Food Products from Selected Food Materials ( Dried Fruits, Dried Vegetables and Dried Root Crops)  7. Techgreen (Project cooperator for the GAA project "Development of Alternative Techniques for Okra Flakes/Sheets Processing")
2. Amount of revenue generated from partnerships		25 M	25 M	25 M	25 M	100 M	45.7 M	134.9 M	401.7 M	50.6M	632.9 M		Received funds from DOST and attached agencies and other government agencies for the conduct of 22 projects:  1.GEMP Compliance Assessment of Local Government Units 2.Towards Leveling-Up Onelab for Research, Development and Innovation 3.Developing the Capability of Micro and Small-Scale Processors in the Manufacture of Quality Food Products from Philippine Coco Beans 4.Development of Draft Standards and Recommended Code of Practice (RCP) Processing of Peanut Butter 5.Pilot Implementation of ITDI's Pre-Commercialization Tools/Strategies for Effective Transfer and Commercialization of Generated Technologies and Intellectual Properties - Y2 6.Development and Field Testing of Retort Foods as Food Ration for Men in Uniform During Combat and Other High Risk Operation 7.Thermal Processing of Selected Materials Using Agitated-Type Retort 8.ADMATEL Expansion Towards Long Term Competitiveness and Sustainability Phase 2: ADMATEL Geared for PHL Industry 4.0 9.DOST-MOST China Joint Research Program - Green Oil and Phytochemicals from Cashew 10.Development of Multiple Materials Platform for Additive Manufacturing MATDEV Y3  11.Project 2. Combination Therapy: Lytic Bacteriophages and Plar Extracts against Multidrug-Resistant Bacteria 12.Project 3. Detection of Food and Water-Borne Bacterial Pathogens using Phage-based Diagnostics 13.Project 4. De Novo Synthesis of Non-Infective Zika Pseudovirus as Reference for Diagnostics and Vaccines Development 14.Project 1. Isolation and Purification of Philippine Common Viruses with Medical Importance and Pandemic Potential for Antigen-Antibody Studies

	UACS		Phy	sical Targe	ets			Physical	Accomplishme	nts	*	1	
Particulars	CODE	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	Variance as of Q4	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14
													15. Project 5. Development of a Real Time Polymerase Chain Reaction for Point of Need Detection for African Swine Fever Viru (ASFV) 16. Project 6. Development of a PCR-based Detection Kit for Tomato Yellow Leaf Curl Virus (TYLCV) Philippine Strains 17. DOST-CITEM Innovative Food Products under the Value Food Innovation Program for IFEX 2021 18. Development of Mobile Modular Food Processing Facility (MFPF) 19. Development of FIC Competency in Moving New Products fror Concept to Market Launch 20. Virtual Livellinood Training Program on Nata de Coco and Ube Processing for Filipino Women Residing in Sri Lanka 21. DOST-ITDI Strategic Communication Portfolio for Enhanced Technology Promotion and Transfer Y2 22. Design and Prototyping of Salt Harvesting Machine Program Title: Accelerated R&D Program for Capacity Building of Research and Development Institutions and Industrial Competitiveness:
Output Indicators  1. Number of projects completed		3	3	0	14	20	7	6	0	15	28	+8	Collaborative Research and Development to Leverage Philippine Economy (CRADLE)  Q4 2021: 15 GAA projects were completed:  1. RDR-EBD-2020-06 - Dissolved Copper Removal from Semiconductor Wastewater Effluent by Electrowinning Process.  2. RDR-PTD-2020-04 - Development of Anti-oxidant film based on chitosan containing spent ground coffee extract  3. RDR-PTD-2020-05 - Exposure assessment of Filipino Consumers to benzophenone migrated from paper and paperboard used as packaging for food and beverages  4. RDR-PTD-2020-03 - Shelf life extension of fresh-cut pineapple by application of alginate-based edible coating with lemongrass essential oil  5. RDR-PTD-2020-01 - Development and Assessment of Bacterial cellulose derived from fruit waste as a bio-based plastic film
													6. RDR-CED-2021-01: Isolation, characterization and utilization of waste lignin in biobased adhesives. 7. RDR-CED-2021-02: Scale-up of Power Back-up System for Large Equipment. 8. RDR-STD-2021-03: Bench-Scale Production, Verification of Optimized Parameters and Sensory Evaluation for the Market Research of Halal Cosmetics and Toiletries 9. RDR-MSD-2021-01: 3D-Printed Carbon-based Flexible Piezoresistive Wearable Sensor for Smart Device Gesture to Speech Applications - Year 1 10. RDR-MSD-2021-02: Porous Nanocarriers for Drug Delivery Applications - Year 2
													11. RDR-MSD-2021-03: Superparamagnetic Iron Oxide Nanoparticles (SPIONS) from Natural Mineral Deposits for Industrial and Biomedical Applications - Phase 2  12. RDR-MSD-2021-04: Development of an Antimicrobial Wound Dressing from Bacterial Cellulose-Nanoclay composite - Phase 1  13. RDR-MSD-2021-05: Development of Bioinspired Composite Membrane Separators for Advanced Rechargeable Lithium-ion Batteries - Phase 1: Fabrication of Bioinspired Composite Membrane Separators from Abaca Fibers  14. RDR-FPD-2021-05: Ultrasonic Assisted Extraction (UAE) and Microencapsulation of Virgin Coconut Oil (VCO); Phase 1: Development of UAE and Microencapsulation Processes  15. RDR-FPD-2021-06: Development of New Shelf Stable Food Products from Fruits, Grains and Vegetables

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
													No completed project for Q3 2021.  "Some projects were carry-over from 2020 due to COVID-19 Q2 2021:6 GAA projects were completed:  1. RDR-FPD-2020-01 - Development of Alternative Techniques Okra Flakes/Sheets Processing 2. RDR-FPD-2020-03 - Establishment of Food Safety System f High Risk Bakery Products for Public Consumption 3. RDR-FPD-2020-05 - Improving the Quality of Deep-Fat Friet Cassava Chips 4. RDR-FPD-2020-06 - Natural Flavorings from Local Sources Food Additive Study 1: Optimization of Spray Drying of Flavors from Fermented Fish and Shrimps 5. RDR-PTD-2019-06 - Development of Intelligent Packaging Colorimetric Sensor as Total Volatile Base Nitrogen (TVBN) Indicator 6. RDR-TSD-2020-01 - Market Testing of FIC Technologies/Products through collaboration with existing ador —-000 Q1 2021: 8 projects were completed: 1. RDR-CED-2019-01 - Natural Hydrocolloid as Alternative Emulsifier and Stabilizing Agent from Okra (Hibiscus esculentus Pods 2. RDR-CED-2020-02 - Processing of Anti-freezing Agent for Biodiesel 3. RDR-CED-2020-03 - Development of Uninterruptible Power Back-Up System Using Motor Control for Lighting Applications Sample Electrical Load

			Phy	sical Targe	ets			Physical	Accomplishme	nts			
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1	2	3	4	5	6	7	8	9	10	11	12	13	14
													RDR-CED-2020-04 - Catalytic Hydrogenation and Transesterification of Highly Unsaturated Fatty Acids from Rubber Seed Oil 5. RDR-CED-2020-05 - Bench-scale Production of Curcumin from Philippine Turmeric using Different Extraction Methods 6. RDR-PTD-2020-02 - Establishment of Shelf Life and Safety of Chilled Ready to Heat and Freshly Cooked Ready to Eat Foods Sold in Convenience Stores and Delivery Service 7. RDR-EBD-2020-01 - Development of a Fermentation Product (Kimchi-Filipino adaptation) from locally-grown vegetables using indigenous LAB isolates as starter culture
Percentage of projects implemented within the approved timeframe		100%	100%	100%	100%	100%	100% (46/46)	100% (38/38)	100% (36/36)	100% (38/38)	100%	0%	*For Q2 2021, the reported suspended project titled "Design and Fabrication of UV-C Surface Disinfection Cabinet" was not really implemented/started because it has a formal request dated Feb 11 2021 for the withdrawal from project implementation.  *For Q3, 2021, the reported project titled "Surface-Modified Zeolite Adsorbent System for VOC Pollutants in ITDI Indoor Laboratories" was implemented during the quarter. The request for suspension until end of the year was approved last August 18, 2021 due to unavailability of chemicals.
3. Percentage of projects completed which are published in peer-reviewed journals, presented in national and/or international conferences, or with IP filed or approved		5%	5%	5%	5%	5%	36% (45/126)	38% (48/126)	41% (52/126)	41% (52/126*)	41%	+36%	*52 out of 126 completed GAA projects from the last 5 years (2016-2020) were published/ presented/ filed for IP as of Q3 2021  No reported completed GAA prijects from the last 5 years (2016-2020) that were published/ presented/filed for IP as of Q4, 2021.
I. Industrial Technology Transfer Program  Outcome Indicators 1. Percentage of clients that rate the technology transfer as satisfactory or better		90%	90%	90%	90%	90%	100% (5/5)	0%	100% (5/5)	100%	100% (13/13)	+10%	*3 out of 3 clients rated technology transfer as satisfactory or better during Q4 2021

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	UACS		Phy	sical Targe	ets			Physical	Accomplishmen	nts		Variance as	
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1	2	3	4	5	6	7	8	9	10	11	12	13	14
Output Indicators  1. Number of knowledge/technologies diffused	8 12 15		10	45	78	35	33	11	157		Q4: 11 knowledge/technologies were diffused 1. SD Soy Sauce 2. SD Egg 3. Cucumber Processing 4. VF Mushroom 5. Taro Processing 6. Sweet Potato Chips 7. Malunggay Tea 8. Malunggay Capsule 9. Power Back-up System for Small and Large Equipment 10. Halal-compliant moisturizing lip balm 11. Halal-compliant herbal whitening toothpaste		
													Q3: 33 knowledge/technologies were diffused 1. Coconut Water Concentrate 2. Buko Pie 9. Buko Pie 9. Mushroom Culture and Production 4. Oyster Sauce Processing 5. Coconut Skim Milk 6. RTE Chicken Egg 7. Syrup from Rice Bran 8. single-use plastics 9. RTE Chicken Adobo 10. RTE Beef Curry 11. RTE Steamed rice 12. RTE Adobong Kangkong 13. RTE Chicken Afritada
													14. RTE Bangus Sisig 15. RTE Beef-Filled Suman 16. RTE Chicken Soup 17. RTD Rice Milk 18. Liquid Detergent 19. Drum Carbonizer 20. Nata de Coco 21. Ube Chips 22. Ube Halaya 23. SD Bagoong Balayan 24. Coconut sap sugar 25. Nanoprecipitated Calcium Carbonate 26. Slimming Cream 27. RTE Cassava 28. RTE Corn Soup 29. RTE Mongo
Number of knowledge/technologies diffused (Cont.)													30. Active Packaging for Moriay 31. Carrageenan Capsule 32. Analgesic Balm 33. Packaging technology for Durian  Q2 2021: 35 knowledge/technologies were diffused through different online platforms and media: 1. Salt lodization (Process) 2. Ube Snack Food 3. Butterscotch 4. Ube Powder 5. Halaya 6. Drum Dried Makapuno 7. 30 Printed Valve Chamber

r/	UACS			sical Targe				Physical	Accomplishme			Variance as	
Particulars	CODE	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	of Q4	Remarks
	2	3	4	5	6	7	8	9	10	11	12		8. Banana strings 9. Banana ketchup 10. Banana ketchup 11. Breadfruit chips 12. Breadfruit flour 13. Coconut Flour 14. Coconut Burger 15. Coconut Macaroons 16. Halal Lipstick 17. Halal Shampoo 18. Halal Soap 19. Liquid Hand Soap Production 20. Plastic Densifier 21. Retort Egg 22. VF Okra 23. VF Squash 24. VF Sweet Potato 25. Abace Fibre Reinforced Composite for Boat 26. RTD Coconut Mungbean 27. Bloremediation technologies to fix heavy metal contamination 28. Halal Emulsified Chicken Meat Processing 29. Dragon Fruit Processing 30. Collapsible Toilet 31. Utility Tent 32. Ceramic Water Filter 33. Emergency Disinfection System 34. Filter in wastewater in fruit plant 35. Freeze Dried Products (Mango and Pineapple)  Q1 2021: 78 knowledge/technologies were diffused through different online platforms and media: 1. Calamansi Dietary Fiber 2.Vinegar Production using ITDI Acetator Kit 3. Alcohol Making 4. Banana Chips 5. Cacao Roaster 6. Cacao Desheller 7. Cacao Grinder 8. Calamansi Processing 9. Compact wastewater treatment system for QSRs 10. Dried Fish Processing
Number of knowledge/technologies diffused (Cont.)													10. Died Fish Processing 11. Ebulliometer 12. Fish Paste Processing (Fermented Fish) 13. Fish Sauce Processing (Fermented Fish) 14. Freeze Dried Products (Mango and Pineapple) 15. Fruit Puree and concentrates 16. Ginger Candy 17. Guyabano Tea and Capsule 18. Hand Sanitizer Production 19. Household Tumbling Composter 20. Liquid Dishwashing Detergent 21. MOSYMU 22. Nipa Sap Sugar 23. OL Trap 24. Portable Biogas Digester 25. RTE Chicken Arroz Caldo

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1	2	3	4	5	6	7	8	9	10	11	12	13	14
													26. Sagip NutriFlour 27. Salt iodization Machine 28. Salt Washer 29. Soap Making 30. Trickling Filter System for Removal of Nitrates and Phosphate from Wastewater Effluent 31. Vacuum Fried Langka 32. Virgin Coconut OI (VCO) Processing 33. Waste Analysis and Characterization Study (WACS) Plan Preparation 34. Wine Kit 35. Bangus in Oil Processing (Thermal Processing) 36. DOST Tablea Processing 37. Drum Dried Mango 38. Nanoclay 39. Natural Fiber Thermoplastic Composite

	UACS		Phy	sical Targe	ets			Physical	Accomplishmen	nts		Variance as	T
Particulars	CODE	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	of Q4	Remarks
1	2	3	4	5	6	7	8	9	10	11	12		40. Smoked Fish in Oil Processing (Thermal Processing) 41. Tuyo in Oil Processing (Thermal Processing) 42. 3D Printing Services 43. Basil Sauce with Pili Peels and Pulp Oil 44. Bioreactor 45. Bottled Bangus and Potato Chips 46. Dual Drum Composter 47. Emergency Food Reserve 48. Extraction of Essential Oils 49. Ginger Tea Processing 50. Gourmet Salt Spice Mix 51. Herbal Milk Tea - Banaba Leaves 52. Herbal Milk Tea - Moringa Leaves 54. Herbal Milk Tea - Soursoup Leaves 55. Herbal Milk Tea - Banaba Leaves 56. Herbal Tea - Banaba Leaves
Number of knowledge/technologies diffused (Cont.)													56. Herbal Tea - Bitter Melon Leaves 57. Herbal Tea - Mangosteen Leaves 58. Herbal Tea - Moringa Leaves 59. Herbal Tea - Soursoup Leaves 60. Isotonic Drink 61. Mango Peel Dietary Fiber 62. Massage olls using VCO with Essential oils 63. Mayonnaise with Pili peels and Pulp oil 64. Mayonnaise with VCO 65. Mixed Fruit Peel Dietary Fiber 66. Mouthwash with Calamansi Seed Oil 67. Nutribun Making 68. Pili Pulp Dietary Fiber 69. Pili Pulp Dietary Fiber 69. Pili Pulp Oil 70. RTD Tablea 71. RTE Smoked Fish 73. Tomato Pomace Dietary Fiber 74. Tomato Sauce with VCO 75. Tomato Sauce with VCO 76. Tomato-galic sauce with VCO 77. Toothpaste with Calamansi Seed Oil 78. Turmeric Tea Processing
Number of technologies transferred/ commercialized through technology transfer agreement		1	1	2	1	5	6	0	16	5	27	722	Q4 2021:  1. Abaca Fiber Composite (Cagayan State University)  2. Essential Oil Extraction (Onset Cooperative)  3-5. VF Okram Squash, Mushroom (Jannah's Food Store)  Q3 2021:  1-3. Halal Lipstick, Halal Shampoo, and Halal Soap (Affection8 Consumer Goods Trading)  4-6. VCO, Coconut Flour, and Coconut Skim Milk (Poverello Farms)  7-8. Salt Washer and Salt Iodization Machine (NSB Engineering Design & Fabrication Incorporated)  9-11. Halal Chicken Sausage, Halal Chicken Burger Patty, and Halal Chicken Nuggets (Kasama Halal Producers Coop.)

	UACS		Phy	sical Targe	ets			Physical	Accomplishme	nts		W	I
Particulars	CODE	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Total	Variance as of Q4	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14
													12-16. Ube Powder, Ube Chips, Ube Butterscotch, Ube Halaya and Nata (Filipinas in Sri Lanka through the Philippine Embassy in Sri Lanka) Q1 2021:  1. Vacuum Fried Langka (Bounty Harvest Corp.,) 2. Calamansi Processing Plant Set-Up (Campfarms, Inc. and Maryland Manufacturing Corp.) 3. Setting Up of a Start Up and Operation of a Trickling Filter System for the Removal of Nitrates and Phosphates from Wastewater Effluent (CENMACO) 4-6. Acetator Kit, Wine Kit, Ebulliometer (Lozada Machineries Corp.)
<ol><li>Percentage of request for technology transfer</li></ol>		95%	95%	95%	95%	95%	100%	0%	100%	100%	100%	+5%	*3 out of 3 requests for technology transfer were provided within the required time frame during Q4 2021
that have been provided within the required time frame							(5/5)		(5/5)	(3/3)	13/13		
III Industrial Technology Technical Services Program Outcome Indicators 1. Percentage of customers that rate the technical services as satisfactory or better		90%	90%	90%	90%	90%	99.86% (736/737)	100.00% (646/646)	99.81% (528/529)	99.6%	99.82%	+9.82%	*790 out of 793 clients rated the technical services as satisfactory or better during Q4 2021
Output Indicators 1. Number of technical services rendered		5,000	5,000	5,000	5,000	20,000	4,594	4,168	2,074	12,981	23,817	+3817	
Percentage of request for technical services that have been provided within the required time frame		90%	90%	90%	90%	90%	100% (4,594/4,594)	100% (4,168/4,168)	100% (2,074/2,074)	100% (12,981/ 12,981)*	100% 23,817/ 23,817	+10%	*12,981 out of 12,981 of technical services were provided within the required timeframe
Number of clients     benefitting from technical     services		500	1,000	1,000	500	3,000	899	6,463	4,216	4,804	16,382	+13,382	

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Date: January 10, 2022

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Director, ITDI

Date: January 10, 2022