## APPENDIX A

## **Related Pictures**



Figure A-1 Fresh coffee pulp (left) and dried coffee pulp (right)



Figure A-2 Coffee pulp powder



Figure A-1 Coffee pulp extract (left) and solid residue (right)



Figure A-2 Cellulose fiber (left) and CMC (right)

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Figure A-3 Coffee pulp film during drying process (left) and final formulation of coffee pulp film (right)



Figure A-4 Biodegradability testing: Coffee pulp film (left); Control (right)



Figure A-5 Shelf life testing of fresh cut carrot: Coffee pulp film (left); Conventional packaging; polyvinylchloride cling film (right)



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(Q	(2014). Effects of pH and anthocyanin concentration on color	
22	and antioxidant activity of Clitoria ternatea extract. Food and	
53	Applied Bioscience, 2(1), 31-46.	
	Kungsuwan, K., and Wiriyacharee, P. (2015). Response surface	
	modeling of process parameters for aqueous extraction of pectin	
	and chlorogenic acids from coffee pulp. Paper presented at the	
	Payao Research Conference 2015, Payao University, Payao,	
	Thailand, 29-30 January (pp. 716-726). Payao, Thailand: Payao	
	University	



University.