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A REVERSE LOGISTICS NETWORK DESIGN PROBLEM IN THE DAIRY INDUSTRY

Designing a value-creating whey recovery network is an important reverse logistics problem in the dairy industry. Whey is a byproduct of cheese making with many potential applications. Due to environmental legislation and economic advantages, raw whey should be processed into commercial products rather than disposed of into the environment. In this talk, I introduce a whey reverse logistics network design problem under demand uncertainty, where demand is the amount of raw whey produced by a set of cheese makers. We formulate the problem as a hierarchical facility location problem with two levels of facilities and use two-stage stochastic programming to tackle the issue of uncertainty. We consider a sample average approximation method to estimate the expected cost and employ an accelerated Benders decomposition algorithm to solve the resulting formulation to optimality. The value of stochastic solution in a case study signifies the importance of considering the uncertainties that are inherent in the dairy industry. Our analysis of the case study shows that the total expected cost is increased by 28% if such uncertainties are ignored.

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WED 6 OCT 4PM - 5PM AEST

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