・研究課題名

　Planning and Evaluation System of Multilayer Integrative Circulation Region for Organic Wastes

・研究代表者名及び所属

　Tsuyoshi FUJITA (National Institute for Environmental Studies (NIES))

・共同研究者名及び所属

　Masahiro OSAKO, Kaiqin XU, Minoru FUJII, Rokuta INABA (NIES)

　Shizuka HASHIMOTO (Kyoto University)

　Yutaka GENCHI, Hideaki KURISHIMA, Tomohiko IHARA (National Institute of Advanced Industrial Science and Technology)

・要旨

This study aims to provide basic information for supporting the policy planning on the formation of resource circulation region. The information about technologies, projects, perspective on systems and problems related to the creation of resource circulation region was collected and summarized through literature survey and hearings.

Plastics and mixed paper in municipal solid waste are valuable resources with high calorific value. However, the recycling cost to utilize them tends to be expensive. In addition, recycling system has to be consistent with the reduce of wastes on which should be put higher-priority to lower carbon emission and save resources in the long term.

In this research, we proposed a recycling system (smart recycling system) which consists of a local center and existing facilities in arterial industries. It was suggested that, by utilizing existing facilities in arterial industries which have enough and flexible capacity to accept those wastes, the system can be a robust system even if the amount of wastes generation fluctuates widely.

The resource circulation technology of organic waste was summarized as technological inventory data. Especially, for Smart Resources Center (SRC), processes of two systems were designed from the viewpoint of cost-effectiveness, and cost curve and CO_2 emission curve which related to the facilities scale were calculated. Conditions suited for the location of the SRC was shown from cluster areas and population density by using the aptitude evaluation model which consists of Grid City Model. It was evaluated that the GHG emission in Japan will be reduced by up to 1% by the introduction of SRC.

We assessed the GHG emissions from the pork production systems feeding the feed from food residues (FRs) to confirm environmental availability of feed from food residuals, using LCA methods. GHG emissions from the systems using the feed from dehydration process were varied ±10% compared to GHG emissions at conventional pork production system.

We estimated the acceptability of the consumer to the pork produced with feed made from food residuals using a web marketing survey and an in-store survey. Many consumers accepted and assigned added value such pork. It is suggested that the high acceptance is also due to the information provided about food residual-recycling and GHG reduction.

Local authorities' areas where the recycling system is cost-effective by the introduction of Smart Resources Center (SRC) were selected from Tokyo metropolitan and around prefectures by using the aptitude evaluation model which consists of Grid City Model. As a result of regional simulations using the GIS database for the local authorities' area

which selected as cost-effective, it was shown that cost will be decreased and that the GHG emissions will be reduced by the introduction of SRC. It has been understood that the SRC is excellent in cost-effectiveness compared with Global warming countermeasures in the waste sector.

・キーワード

Organic renewable waste, Circulation Region, Arterial Industry, Vein Industry, Food residues