



MINISTRY OF ECONOMY
DEPARTMENT OF STATISTICS MALAYSIA

Feasibility, Usability and Cost of Conventional Versus Single-Use Biodegradable Meal Trays: A Pilot Study in Hospital Sultanah Bahiyah, Alor Setar

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“Looking Beyond GDP: Towards Social Well-being and Environmental Sustainability”

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INTRODUCTION

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Rice bowl of Malaysia.



>200,000 hectare of paddy field¹.



Paddy straw (*jerami*) is by-product of paddy harvesting process.



Paddy straw were burnt before next planting season.



A local company bought paddy straw from local paddy planter.



Turned it into biodegradable medical utensils.



Products have been exported to NHS Hospitals.



HSB was approached on the feasibility of using biodegradable meal trays for patient.



Food service in hospital encompasses many steps².



Traditional meal trays made from plastic or stainless steel. Heavy, high maintenance cost³.



Biodegradable meal trays has gained attention as a potential solution.

OBJECTIVE

To assess the feasibility, usability and cost of conventional versus single-use biodegradable meal trays made from paddy straw



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METHODS

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STUDY LOCATION:

- Dietetics and Food Service Department, and all wards at Hospital Sultanah Bahiyah, Alor Setar.



STUDY DURATION:

- 1st July 2021 – 30th Sept 2021



STUDY PROCEDURE:

- Replaced all conventional meal tray for patient to biodegradable type during study period.



PRODUCT USED:

Biodegradable Single-use Meal Tray.

- Provided by a local company from Kedah.
- Made from paddy straw.
- The products accredited by the international and local certification bodies.



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DATA COLLECTION:

1. **Data from observation** on a workflow. Time motion analysis performed to map out the workflow.
2. **Focus group discussion** with all staff handling the meal trays.
3. **Data on direct cost** of each component involved.



STATISTICAL ANALYSIS:

- A simple cost comparison with a time horizon set for five years.



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RESULTS

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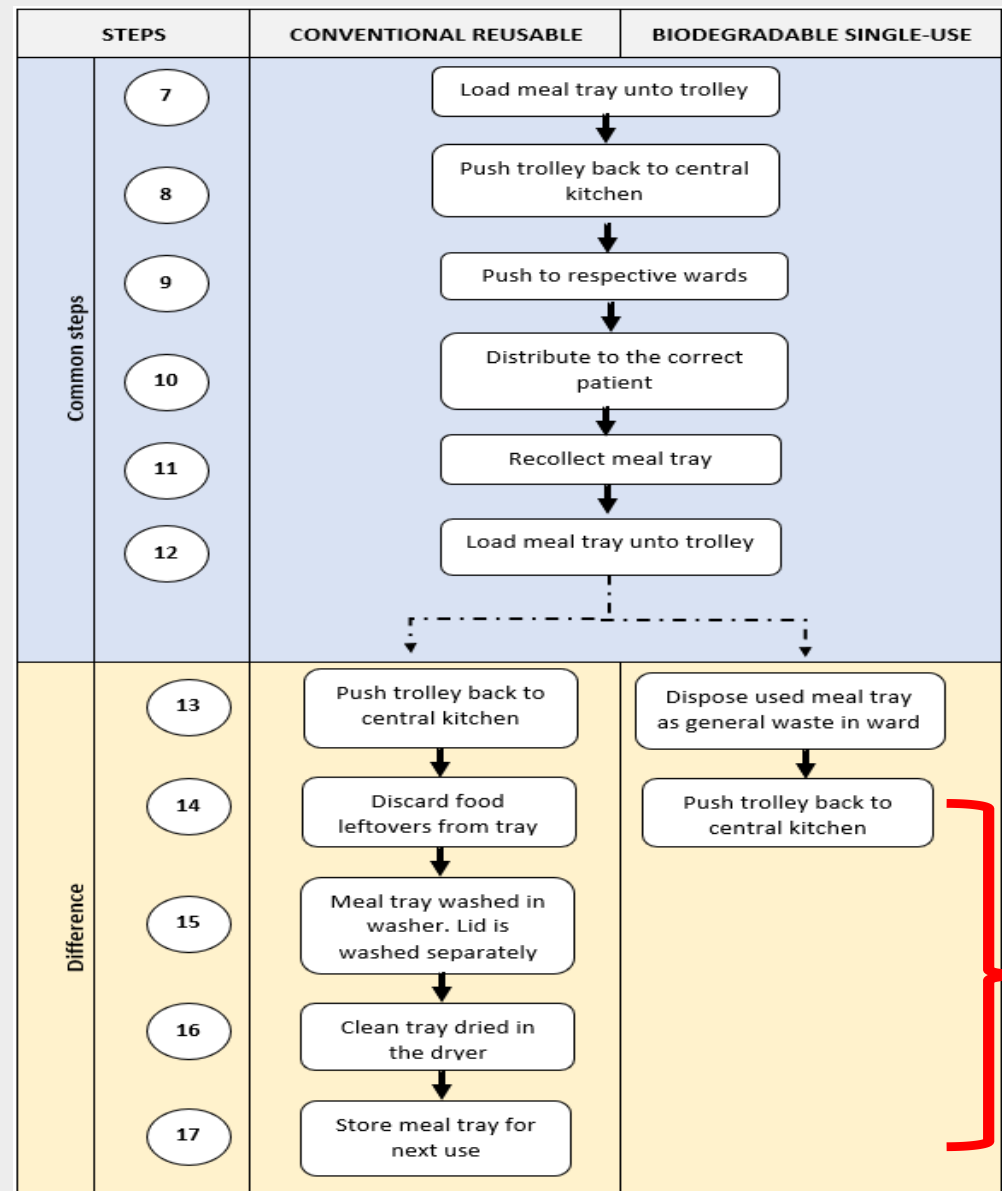
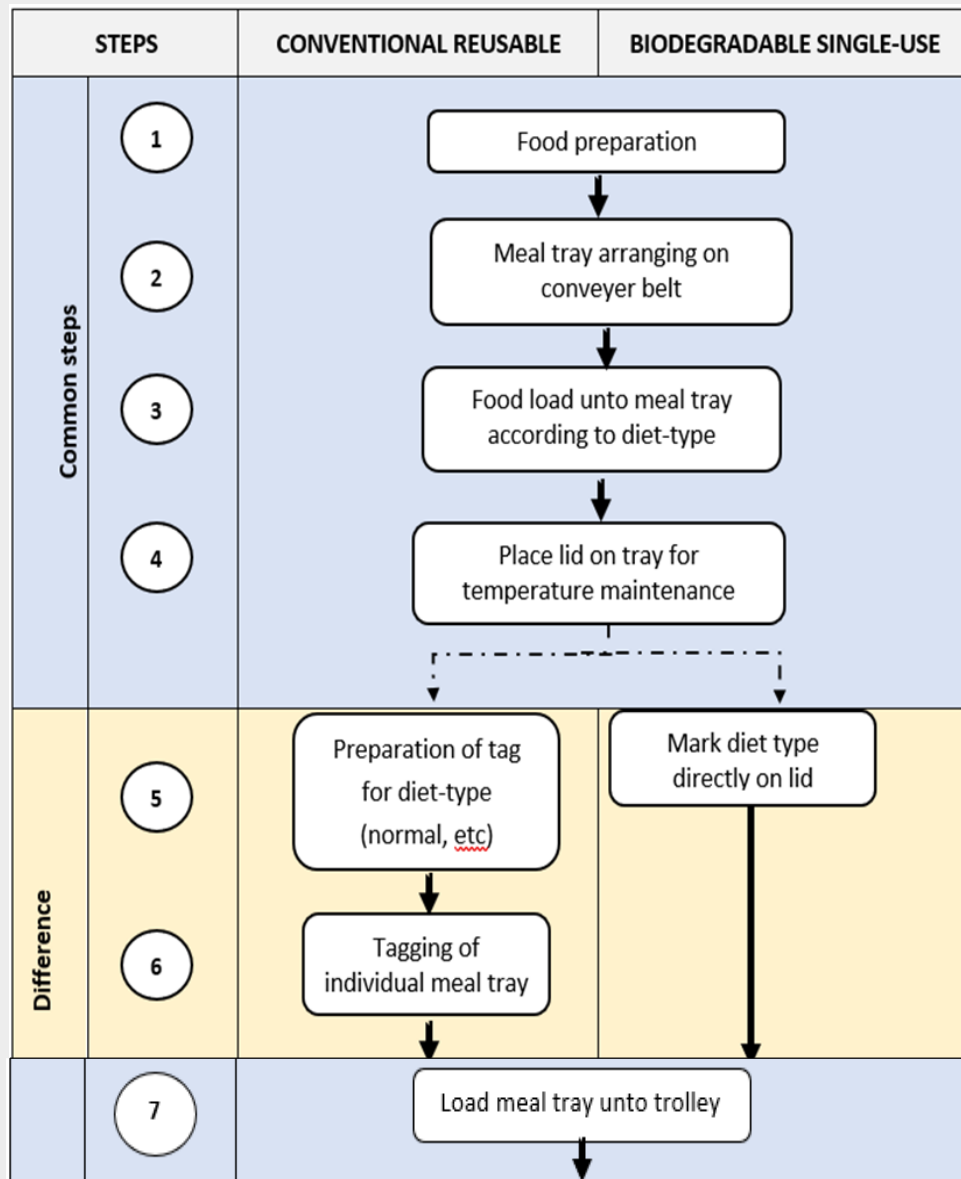
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WORK PROCESS

- With the use of Biodegradable Meal Tray, the work process become **more streamlined**.



Figure 1: Work process comparison for meal tray



Trays are disposed as general waste in wards and thus no longer need to be returned to the central kitchen

1

WORK PROCESS

- With the use of Biodegradable Meal Tray, the work process become **more streamlined**.
- **No** longer a need for the trays to undergo the **washing and drying process**.
- Staff **no** longer required to work **extended hours**.
- **Shorter time** taken to complete meal serving activities (85min vs 220min).



2

END USER FEEDBACK



*“A substantial **reduction of trolley weight** during the transportation of meals”.*



*“**No more sending back** the trays to the central kitchen for washing and drying process”.*



*“Without need to recollect any meal tray, **patients have more flexibility** to have their meal at their convenience”.*





COST COMPARISON

5360

Biodegradable meal trays used during study period.

720

An average use trays per day.





COST COMPARISON

Cost components	Conventional reusable (RM)	Biodegradable single-use (RM)
Item cost	0.18	3.50
Washing, Drying & other processes	0.95	0.00
Labour	4.64	1.68
Total cost	5.77	5.18
<i>Cost reduction</i>		<i>0.59</i>

Table 1. Cost comparison for meal tray by category (per patient over four meals).



COST COMPARISON

Type of meal tray	One year (RM)	Five years (RM)
Conventional reusable *	6,065,424.00	30,728,520.00
Biodegradable single-use	5,445,216.00	27,226,080.00
<i>Cost reduction</i>	11.39%	12.86%

* **Note:** Recurring machine maintenance and repair costs are included estimation for a multi-year period.

Table 2. Cost reduction estimation over one and five years.



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DISCUSSION

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Utilization of biodegradable meal trays in hospital is **feasible, saving costs** and **aiding staff efficiency**.



Hospital adoption of eco-trays showcases eco-responsibility amid rising demand for sustainable healthcare.



Way Forward: The Ministry of Health Malaysia is endorsing the widespread use of biodegradable meal trays, particularly for patient meals, throughout the nation's healthcare facilities



Circular Economy Impact: This project exemplifies the circular economy concept, as the production and utilization of biodegradable products from paddy straw improved socio-economic within the community.



Research Center Capabilities: The successful execution of this project underscores the Clinical Research Center's proficiency in conducting non-clinical studies.



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