Aiming to build a sustainable recycling-oriented society.

循環型社会の構築を目指して

In unison with the Earth

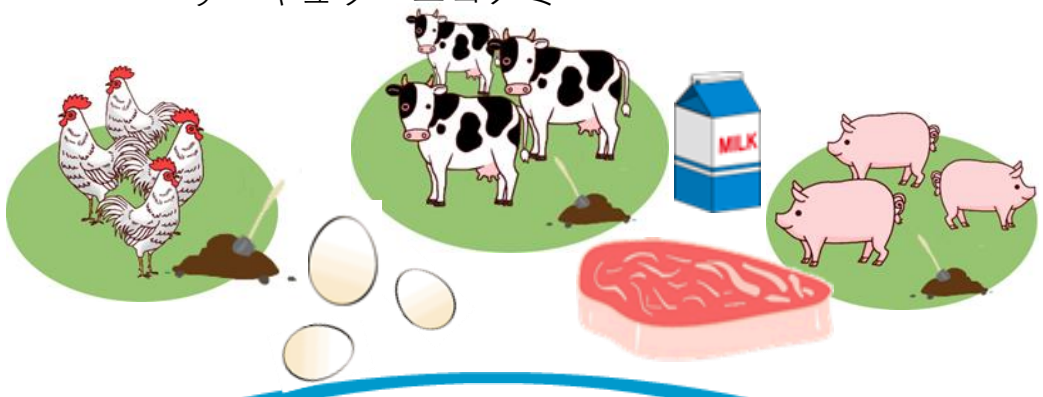
KAWASHIMA CO., LTD.

Circular Economy

サーキュラーエコノミー

BX-1

Probiotics feed additive, Organic and non-GMO



RA-X ラックス

High-temperature composting

BX-1

Feedstuff for animals mixed with BX-1

BX-1 U.N. Approval Special Techniques RA-X ラックス

Organic, recyclable, carbon-dioxide neutral, non-GMO and cost-efficient

RA-X ラックス

Livestock waste into bio-fertilizer

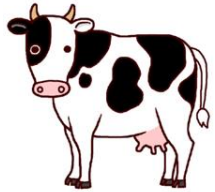
Produce with high nutritious values

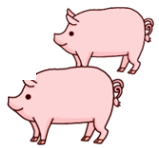
BX-1

Probiotic feed additive

Results of BX-1

- **Lower FCR (Feed Consumption Rate)**
  Less feedstuff to reach carcass weight
- **Shorter Breeding Cycle**
  Less time to reach carcass weight
- **Cost-efficiency**
  Improved FCR and shorter time reduce breeding costs with up to 20%
- **Suppression of Salmonella**
  Study in 3,000 chickens conducted at Yamaguchi University, Japan
- **Reduced Stress in Animals**
  Diseases caused by stress are prevented by optimizing intestinal balance
- **Propagative Power Up and Higher Survival Rate**
  Experimental study conducted at Yamaguchi University, Japan
- **Promotes composting**
  It becomes a high-value-added soil improver by detoxifying it in a short period of time without emitting offensive odors due to the action of aerobic microorganisms. .





- **Improved Quality of Meat, Egg, Milk and more**
  Experimental study conducted at Yamaguchi University, Japan

- **Foul Odours**
  Controlled pH reduces emissions of ammonia and sulphurous compounds
- **Fly Populations**
  Biochemical conditions of manure/slurries are unfavorable for fly eggs and larvae
- **Low BOD and Suspended Solids of Livestock Manure and Slurries**
  Efficient intestinal digestion of feedstuff reduces oxygen demand and forms less solids
- **Reduced Emissions of Greenhouse Gases**
  Less organic substrates of manure/slurries to form gases

Features of BX-1

- **Regulatory**
  Approved by Japanese medical Agency for animal uses
- **Low Dosage**
  1 to 3 kg of BX-1 per ton of feedstuff depending on species
- **Price Competitive**
  Added cost for BX-1 is marginal compared to savings from less time, Less feedstuff and higher survival rates
- **Ready-to-Use**
  Mixes well with dry and wet feedstuff as well as with water
- **Safety**
  Personal protection is not required for handling BX-1
- **Formulation**
  Dry yellowish powder with a smell of bakery
- **Shelf-life**
  Shelf-life is minimum 12 months stored dry at ambient temperature
- **Package**
  Standard package is a laminated paper/PE bag of 15kg

U.N. Approval
Special Techniques

RA-X ラックス

High-temperature composting

高温による堆肥化

U.N. Approval
Special Techniques

Features of RA-X

ラックスの特徴

- **Feedstock**
  Manure, animal slurries, organic household waste, organic by-products
  From agriculture, forestry and food processing industry……..
- **Spiking Agent**
  BX-1 is added, typically 1 kg/ton, to make the process run at high temperature
  Without added energy. Electricity is only needed for aeration and mixing, 4 to 6 hours/day
- **Process**
  Aerobic high-temperature composting. 75℃ - 80℃, that runs for 1 to 3 months
  Depending of feedstock. Reduced volume by 2/3
- **Environmental Issues**
  Aerobic high-temperature composting minimizes emission of greenhouse gases.
  Process is carbon-dioxide neutral
- **Environmental Safety**
  High-temperature is a pasteurization of biomass from pathogens and contagions
- **Personal Safety**
  Personal protection is not required as the process is dust-free, odorless and yields
  No drain water or other by-products
- **Finished Product**
  Soil-like powder ready to use as bio-fertilizer

Composting plant

Mixing under aerobic conditions


Loading of feedstock


Finished bio-fertiliser/ tritious soil

RA-X ラックス

BX-1

The Mechanism of odor emission
脱臭のメカニズム

U.N. Approval
Special Techniques

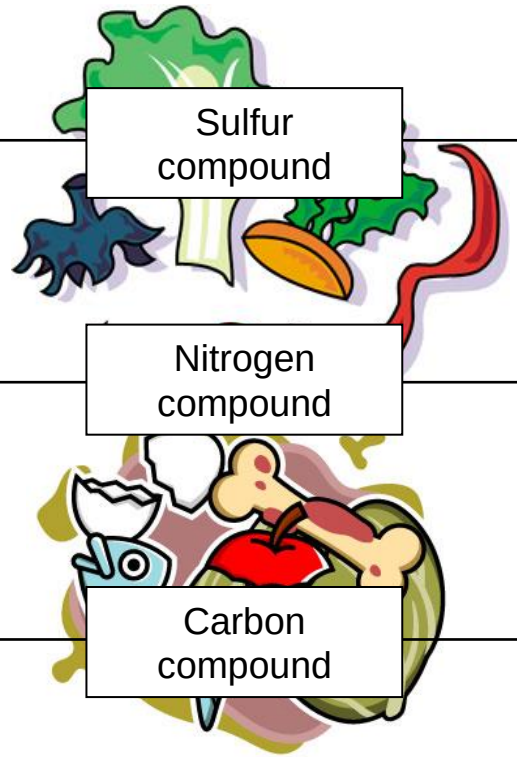
The aerobic fermentation can control methane.
Anaerobic fermentation generates methane which is one of the greenhouse gas.
Compared with carbon dioxide, greenhouse effect of methane is 25 times.

Product
Positive impact on crops

← Aerobic fermentation processing

Anaerobic fermentation processing →

Product
Restricted use on agricultural crops



Sulfur compound

Sulfate (Not a smell) ←

→ Methyl mercaptan (Bad smell) → Hydrogen sulfide (Bad smell)

Nitrogen compound

Nitric (There is not a smell) ← Ammonia (Bad smell) ←

→ Ammonia (Bad smell)

Carbon compound

CO_2 (There is not a smell) ←

→ Volatile fatty acid (Bad smell) → CO_2 (There is not a smell)

→ Methane (Not a smell)

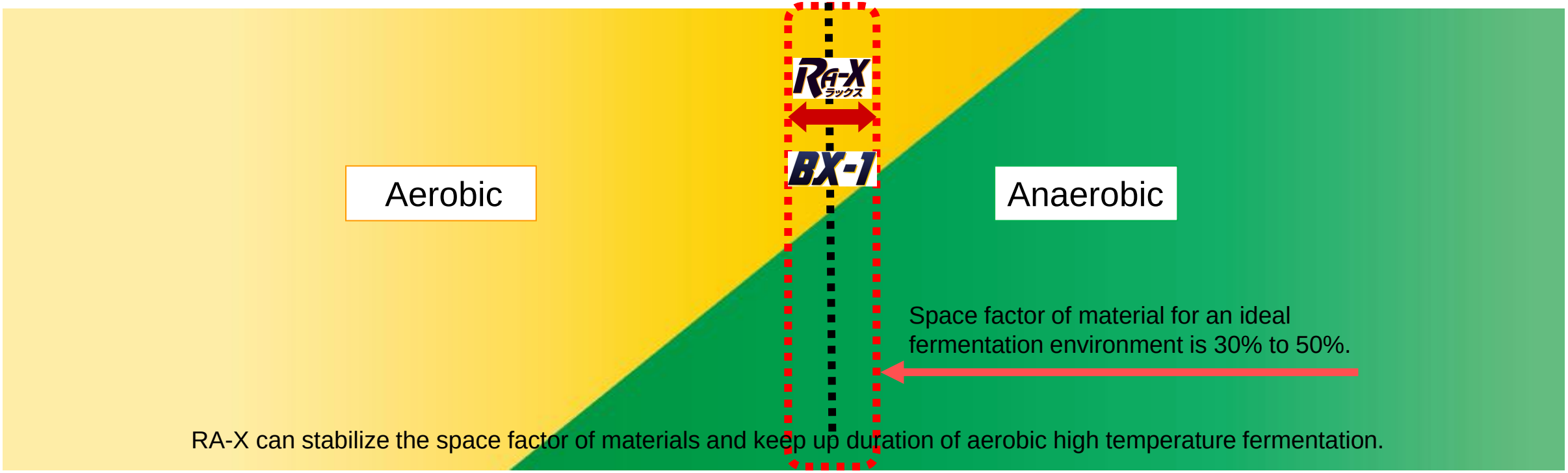
25 times more greenhouse effect

The Features of RA-X
ラックスの特徴

U.N. Approval
Special Techniques

Aerobic fermentation disposition was impossible for large-sized compost plants processing over 100 tons.

General large-sized disposal plants other than RA-X are performing anaerobic fermentation Disposition.(mixed fermentation of anaerobic fermentation and aerobic fermentation)



RA-X can stabilize the space factor of materials and keep up duration of aerobic high temperature fermentation.

Example of composting by BX-1

BX-1を活用した堆肥化の事例

Daily processing 40t

Before using BX-1.
Due to unstable fermentation, there were many problems such as offensive odor, long processing period, and low-quality compost.

After using BX-1.
Odors can be suppressed, the quality of compost has improved, and stable large-scale processing has become possible.

Add BX-1 and ferment
Fermentation heat can be maintained50% shorter processing time than before Odors during processing have also decreased.

UN Recognition

国連の認証

BX-1

Probiotic feed additive

RA-X ラックス

High-temperature composting

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Project 4064 : Co-composting of EFB and POME at PT. Sabut Mas Abadi in Kumai

Project title	Co-composting of EFB and POME at PT. Sabut Mas Abadi in Kumai - project design document (1510 KB) **PDD appendices** Appendix 1 - 4064 ER 4064 (57 KB) Appendix 2 - 4046 F-Price Sheet (18 KB) - registration request form (170 KB)
Host Parties	**Indonesia** , involved indirectly approval (111 KB) Authorized Participants: PT. Api Metra Palm
Other Parties Involved	**Japan** , involved indirectly approval (111 KB) Authorized Participants: ITOCHU Corporation
Sectoral scopes	13 : Waste handling and disposal
Activity Scale	SMALL
Methodologies Used	AMS-III.F. ver. 8 - Avoidance of methane emissions throug
Amount of Reductions	16,275 metric tonnes CO2 equivalent per annum
Fee level	USD 1755.0
Validation Report	Validation report (783 KB) MoC Annex 1 Modalities of Communication valid as of 18/05/2012 **Public availability information** Link to information uploaded for public availability
Registration Date	12 Feb 11 (view history)
Crediting Period	01 Apr 11 - 31 Mar 18 (Renewable)
Requests for Issuance and related documentation	

PROJECT DESIGN DOCUMENT FORM (CDM-SSC-PDD) - Version 03

CDM – Executive Board

Category: Avoidance of methane production from palm oil mill effluent and empty fruit bunches through co-composting

Technology

The proposed project activity will be implemented using unique technology invented by Kawashima Co., Ltd., which is a combination technology of using composting machine RA-X and probiotics BX-1.

The each specific component of the Kawashima Co., Ltd.'s technologies, which is going to be introduced to Sekeman through this project activity, are as follows:

- Screw type compost plant RA-X
- Probiotics BX-1

The major characteristics of combination technology of RA-X and BX-1 are as follows;

- Keeping high temperature during composting
- Easy maintenance
- Possible to aerobically compost treat organic wastes with high moisture content

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