

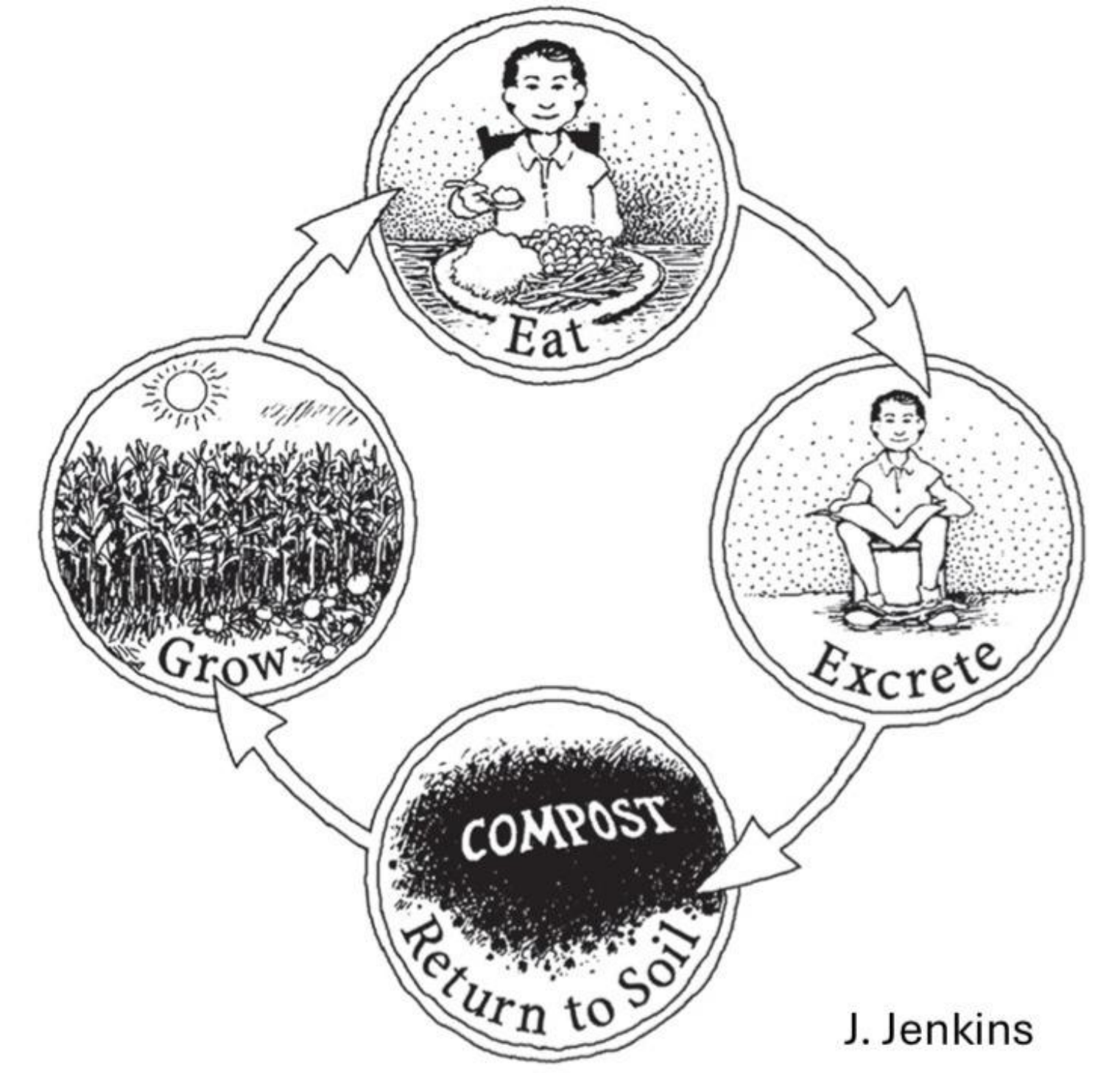
Grow your own, with your own!

Managing a compost toilet system for home gardening

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Sanitation & soil fertility management: promise and challenges

- Resource-oriented sanitation systems (e.g. urine-diverting dry toilet) allow closing the nutrient loop (N, P, K, and others) at household or community level (see fig. at top-right corner)
- Excreta hygienization and groundwater protection can be challenging in a backyard setting, and require proper skills and guidelines
- Here, the current status of ongoing experiments with a compost toilet at household level is presented. This is not part of a formal research project but rather a pilot activity to gain hands-on experience and prepare for more extended developments on the topic

1) Excreta collection with a urine-diverting dry toilet

- Urine is collected separately from faeces with urine separator (see figs. to the right)
- Faeces remains dry, is covered with (a) biochar for odor suppression, and (b) a mixture of wood shavings, dried grass and leaves as composting substrate
- Odor control with (a) citric acid in urine bottle (2-5 g/L), (b) biochar as cover material for faeces, and (c) biochar air filter ventilation (during toilet use)



Urine separator



Separate collection of faeces and urine

2) Controlled composting process („at standard“ & „on time“)

- **Off-ground** compost facility equipped with **leachate collector** and **rain protection**, to keep groundwater safe
- Filling of dry toilet material only at the **center** of the pile (60x60cm), to ensure **thermophilic hygienization** temperatures (50 - 70°C)
- Dry toilet material and other organic residues are added until total compost pile volume is **~ 1m³**
- The pile does not start composting on its own (too dry)
- Thermophilic composting is initiated only between April and October (warm season), by watering the pile (water, urine)
- 2-3 weeks thermophilic phase + ca. 2 months initial curing, without mixing or turning
- Subsequent transfer to on-soil composter for post-treatment with compost worms and curing



Leachate collector



Dry toilet material filled only at the center (60x60cm) Other organic residues added all around



Thermophilic temperatures (50-70°C) are reached at the core



Before



After

Negative coliform test after composting (no green color)

3) Fertilization of the home garden

- After one year, the compost is used as growth substrate in containers or pots
- Urine is mostly used directly as fertilizer
- Astonished visitors' reactions, e.g.: "So big tomato plants in such a small pot! How do you do that?"
- Growers enjoy the good food!



Conclusions and Outlook

- Currently, no guidelines exist in Austria for management of dry toilet and it's content
- The system must be operated „at standard“, „on time“ and ideally „with joy“
- If not initially there, the joy likely will come after seeing the results
- First tests of coliforms are conclusive. Experiment is ongoing
- Over-fertilization of the soil if < 400m²/ person is available → need for a service to collect and transform the excreta to a fertilizer