Practice Note 4:
Preparing vegetables and legumes without soda ash

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Education and Training for Sustainable Agriculture and Nutrition in East Africa

Research on the use and avoidance of soda ash for cooking

Focus group discussions in the EaTSANE project showed that households in Kenya and Uganda regularly use soda ash in the preparation of green leafy vegetables and legumes, mainly with the aim of reducing the cooking time. They produce soda ash by incinerating dried plant matter. Earlier studies showed that soda ash can have an adverse effect on the bioavailability of nutrients such as zinc and iron[1]. In the EaTSANE project, researchers from Universities in Kenya, Uganda and Germany together with local households conducted Trials of Improved Practices (TIPs) to determine perceptions of households regarding improved vegetable and legume preparation methods that avoid the use of soda ash. The participants of the trials were requested to try omitting soda ash for a period of two weeks and report on their experiences afterwards.

The omission of soda ash in green leafy vegetables dishes at first evoked reluctance since the participants expected negative alterations in the texture, taste and colour of the vegetables and a prolonged cooking time until vegetables could get softened. A longer cooking time can lead to the leaching of nutrients and to the participants undesired colour changes of the vegetables. During the trials some study participants perceived green leafy vegetables cooked without soda ash to be tough or disliked the difference in flavour. The study team suggested modifications to address these issues and to gain tasty and culturally acceptable dishes with green leafy vegetables and legumes.

As the study participants mainly used soda ash to reduce the cooking time of legumes, they were encouraged to test pre-soaking to fasten the process. In Uganda, not all households were able to try soaking because they often bought the legumes on the day they were going to cook them. Soaking overnight was not very acceptable due to an incipient fermentation process.

In workshops with participatory cooking sessions, the study participants tasted vegetable and legume recipes prepared without soda ash. Overall, the participants of the cooking trials liked these dishes and expressed their surprise about the good tastes and texture.

[1] Mamiro P, Nyagaya M, Kimani P, et al. (2011) Similarities in functional attributes and nutritional effects of magadi soda and bean debris-ash used in cooking African traditional dishes. African Journal of Biotechnology, 10(7), pp.1181–1185.

Practical implications for cooking practices

The study participants appreciated the following practices to prepare **green leafy vegetables**, while avoiding the use of soda ash:

1. Adding groundnut paste or groundnut powder, sour milk, or avocado to the vegetables to enhance taste and palatability. Frying the vegetables can be another option to enhance the taste.
2. Mixing tough vegetables with soft ones when preparing vegetables. The softer vegetable can be added towards the end of cooking. In case you cook at the same time, chop the tough vegetables into smaller pieces.
3. Bring cooking water to boil before adding vegetables in order to avoid soaking the vegetables and to reduce their cooking time preventing unwanted colour changes.

In the study areas of the EaTSANE project, **legumes**, such as beans, are rarely soaked before cooking. Soaking and discarding the soaking water leads to a reduction in their phytate content, which allows the body to absorb nutrients better[2]. Soaking also shortens the cooking time, ensures that legumes are more easily digested, and reduces the tendency to flatulence. The researchers therefore suggested the following practice:

1. Soak legumes in cold water for 3-8 hours (or overnight),
2. discard the soaking water,
3. and use fresh water for boiling the soaked legumes.

"The beans did not lose their taste as thought, they were tasty"

"It will not result into stomach pains because it doesn't have soda ash"

The new cooking practices had many benefits to the households. The participants and their families liked the dishes and moreover the practices reduced the work to produce soda ash. The shorter cooking time of legumes led to less fuel consumption and nutritional benefits. The soaking of legumes reduced the tendency to flatulence and participants acknowledged the more thoroughly cleaned legumes.

Disbelief and perceptions of poor outcomes prevented some participants from trying new practices during TIPs. The joint cooking sessions with trying new cooking practices and tasting different dishes by both, women and men, proved to be central experiences for the participants to learn and see that the unknown practices are feasible and the resulting dishes are tasty.

[2] Hotz, C., & Gibson, R. S. (2007). Traditional food-processing and preparation practices to enhance the bioavailability of micronutrients in plant-based diets. Journal of Nutrition, 137(4), 1097–1100.

Githeri with Sweet Potatoes and Amaranth

Ingredients (for five people)

- 5 green maize cobs
- 500g red beans
- 3 sweet potatoes
- 2 hand full amaranth
- 3 tomatoes
- 2 onions
- 5-10ml cooking oil
- Salt to taste

Procedure:

- Sort and soak beans for 3-8 hours and discard the soaking water.
- Sort the green maize and wash.
- Put both maize and beans in a saucepan, add water and let it cook.
- Peel the sweet potatoes, wash, chop and set aside.
- Sort amaranth, wash and set aside as well.
- When the beans and maize mixture is ready, in a clean pan fry onions and tomatoes.
- Add salt to taste.
- Add the chopped sweet potatoes and let them cook for a short while.
- Add the maize and beans mixture, stir and let it cook together with the potatoes.
- When the potatoes are almost cooked, add amaranth and let it simmer for a short while to allow amaranth cook but not lose its green color.
- Serve.

Modification from common method: Without soda ash, beans were pre-soaked, addition of sweet potatoes, amaranth, tomatoes, onions.

Cowpea leaves with amaranth and groundnut paste

Ingredients (for five people)

- 2 bundles cow pea leaves
- 2 bundles of dodo/ amaranths
- 8 heaped table spoonful of groundnut paste made of roasted groundnuts
- A pinch of salt
- 1 onion
- 1 tomato

Procedure:

- Wash the vegetables in running water do not soak.
- Cut the vegetables separately into small pieces.
- Put first the tough vegetables in a saucepan and add 1-2 cup of water.
- Bring to boil until tender for 15-20 minutes. Add the soft vegetables for the last 5 minutes.
- Using the green liquid water from the vegetables, dissolve the groundnut paste.
- Add to the cooked vegetables.
- Add salt to taste.
- Simmer for 5 minutes.
- Serve with matooke or posho/ugali.

Modification from common method: Without soda ash, addition of amaranths, tomatoes, onions, extra amount of groundnut paste.

About the EaTSANE project

The EaTSANE project is an interdisciplinary research project on diversified agriculture, nutrition, and value chains, implemented by research and development institutions from Kenya, Uganda, Germany and the Netherlands in the period from 2018 until 2021. The main objectives are to develop more sustainable farming practices and improve diets of households in Teso South, Kenya and Kapchorwa, Uganda by diversifying the food system with a participatory action research approach. The research teams identified practical implications across the project activities, which led to a set of practice notes.

Further reading and training materials

Further reading and training materials can be found: https://www.eatsane.info/publications

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