

Developing Vegetable Sweet

- To solve the international lack of vegetable intake -

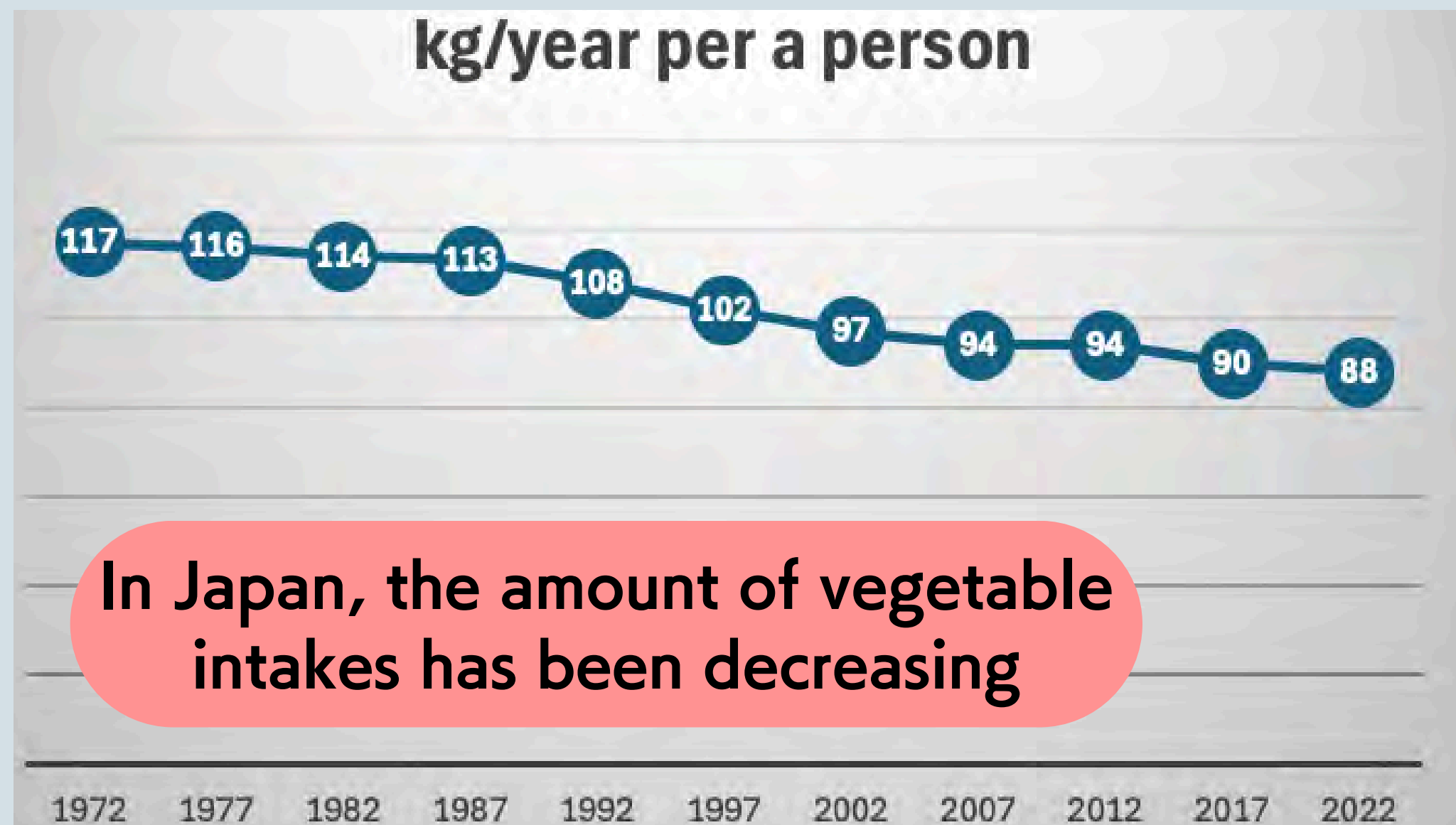
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Background

- ① Some nations establish annual vegetable consumption goals, but many don't achieve them.
- ② Some people believe that vegetables need more time and effort to eat, are not always tasty, and provide fewer opportunities to eat.

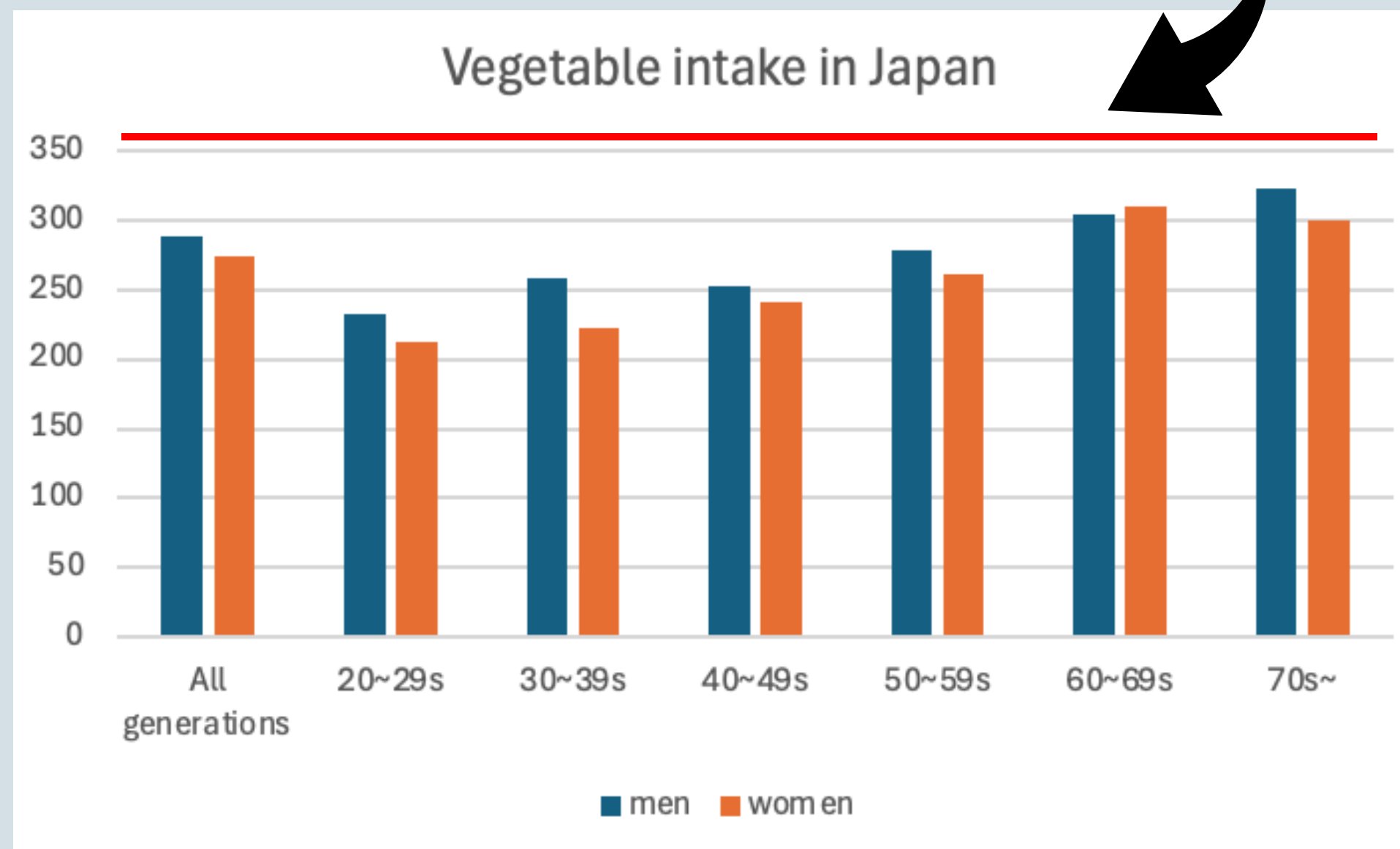
Current situation

Annual vegetable consumption per capita kg/year per a person



In Japan, the amount of vegetable intakes has been decreasing

Vegetable intake by generation in Japan

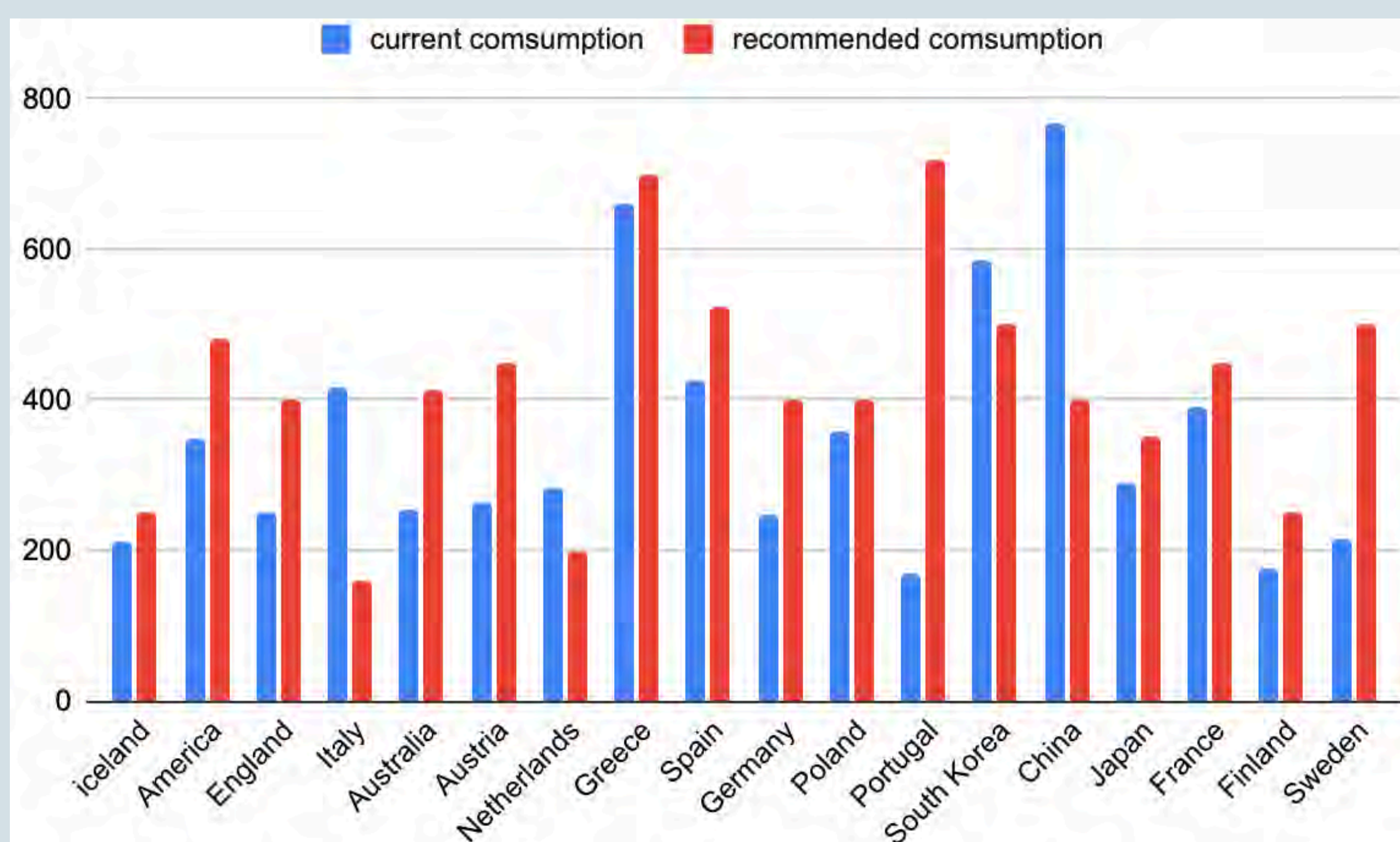


Recommended intakes of vegetable set by Japanese government

Reason for not eating vegetables in Japan



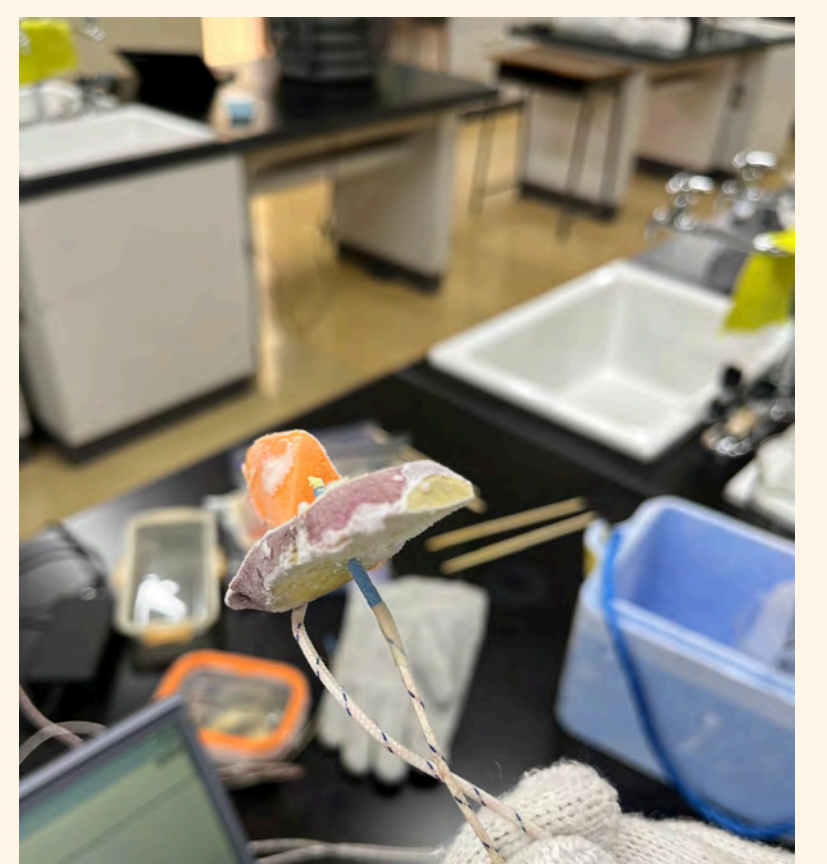
Recommended intakes and current intakes in each country



Experiment 1.

We carried out several experiments to consider which vegetable is most suitable to freeze

- ① Pumpkin
- ② Sweet potato
- ③ Carrot



Experiment 2.

Purpose

To keep or improve the taste of vegetable itself

Result

The texture improved with all three coatings.

The taste was much better with the apple juice coating.

Future

Adding some nutrients to compensate that would be lost in the process of cooking

	1 ³ cubic cm	2 ³ cubic cm
No coating	4pcs	4pcs
Apple juice	4pcs	4pcs
7% Water sugar	4pcs	4pcs
15% Water sugar	4pcs	4pcs

※2 sets of pumpkin and sweet potato for a total of 64pcs



Purpose

Make easy

Make delicious

Make opportunity grow



We suggest new ways of eating vegetables

Frozen Vegetable Sweets

We chose to focus on the increase in sweetness of vegetables when frozen due to freezing point depression.

Molecular weight of sucrose → 342g/mol
 Molar freezing point depression of water → 1.85K·kg/mol
 Mass molarity of sucrose → 5.79mol/kg
 Freezing point depression would be
 $5.79K \cdot kg/mol \times 1.85mol/kg = 10.2K$

How to make

1. Cut vegetables into dice
2. Make coating
3. Freeze rapidly

Become easier
 Become sweeter
 Texture changed

Conclusion & Next Project

Improve the method of coating

PROJECT 1

Improve in details

PROJECT 2

Commercialize

PROJECT 3



References

https://www.jstage.jst.go.jp/article/eiyogakuzashi/82/1/82_44/_pdf/-char/ja
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Through our research, we have been able to reduce the effort involved in eating vegetables and improve the taste of the vegetables themselves. We believe this will lead to an increase in the opportunities for people to eat more vegetables. However, there is still room for improvement, especially in taste. We hope to develop several products in the future that will make vegetables more appealing and acceptable to everyone.