Influence of Scientific Knowledge on Attitudes toward Emerging Technologies

加藤 直子 (Naoko KATO-NITTA) データ科学研究系 特任研究員

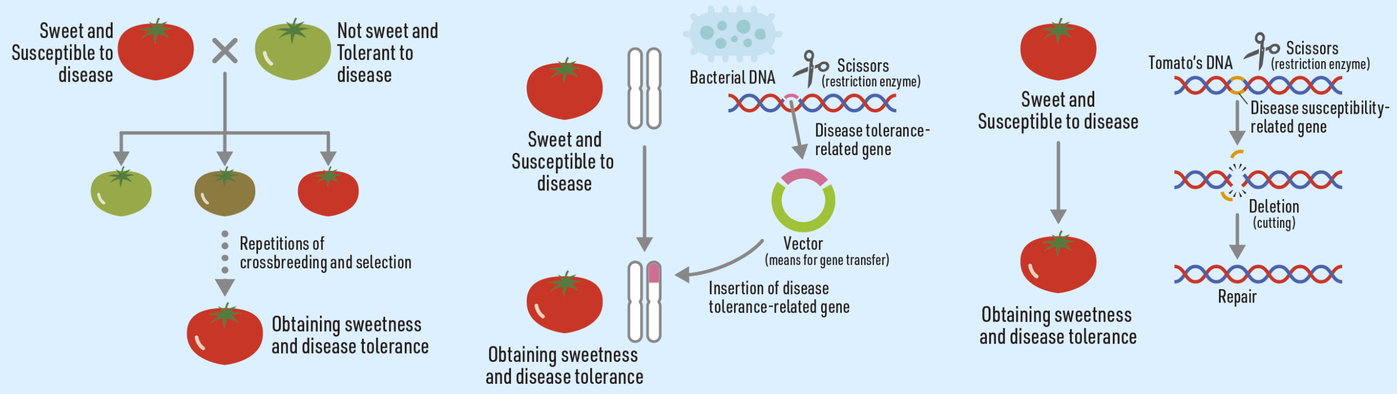
Regulations regarding the application of gene editing on food are being debated around the world. New policy measures often face issues of public acceptance and consensus formation; however, reliable quantitative evidence to serve as a basis for discussion and public perception toward such emerging breeding technologies is scarce. To fill this gap, two web-based surveys were conducted in Japan from December 2016 to February 2017. Participants (n=3,197) were categorized into three groups based on the domain-specific scientific knowledge levels (molecular biology experts, experts in other fields, and the lay public). The assessment was made in four conditions and the attitudinal changes were statistically analyzed, revealing group differences in risk, benefit, and value perceptions of different technologies.

Method

Demographic distributions

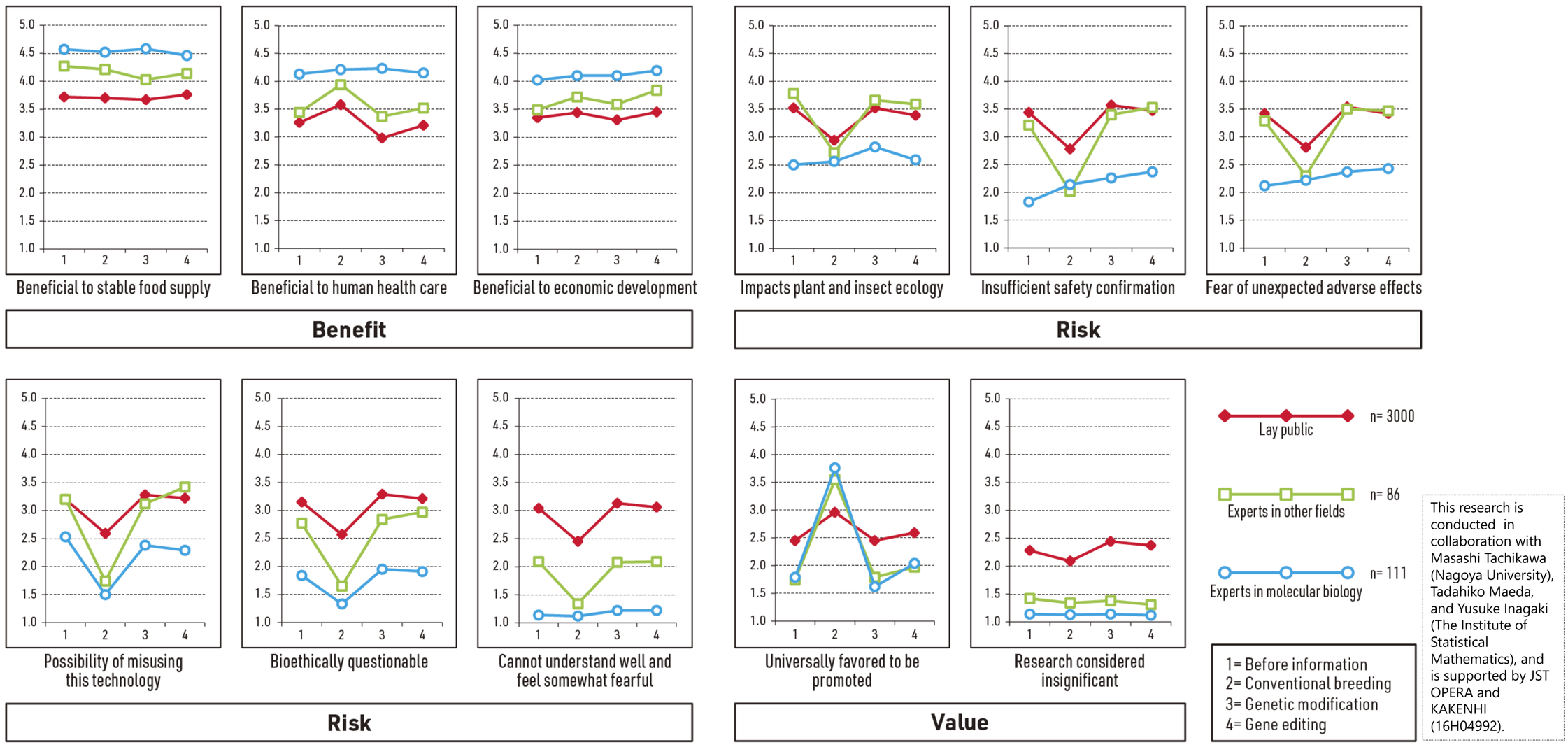
		Lay Public	Experts in other fields	Experts in molecular biology
Gender	Male	50.03%	70.93%	81.98%
	Female	49.97%	29.07%	18.02%
Age	20–29 years	15.47%	12.79%	11.71%
	30–39 years	19.57%	33.72%	22.52%
	40–49 years	23.03%	23.26%	27.03%
	50–59 years	19.33%	20.93%	30.63%
	60–69 years	22.60%	9.30%	8.11%
Education	High school or less	29.00%	0.00%	0.00%
	Vocational college	11.83%	0.00%	0.00%
	Junior college	11.23%	0.00%	0.00%
	College	42.90%	18.60%	10.81%
	Graduate	5.03%	81.40%	89.19%
Annual Income	Under 3,000,000 JPY	60.33%	10.84%	12.04%
	3,000,000 JPY or over	39.67%	89.16%	87.96%
n		3,000	86	111

Information Provision



- **Assessed benefit, risk, and value perceptions on applying genome research to agricultural crops with the 11- item scale.**
- **Examined the differences in mean values of the four conditions of (1) before information on technologies, (2) conventional breeding, (3) genetic modification, and (4) gene editing, using single-factor repeated measures ANOVA.**
- **Observed differences in attitudinal changes of the three groups of lay public, experts in other fields, and experts in molecular biology.**

Results



This research is conducted in collaboration with Masashi Tachikawa (Nagoya University), Tadahiko Maeda, and Yusuke Inagaki (The Institute of Statistical Mathematics), and is supported by JST OPERA and KAKENHI (16H04992).

Conclusion

- **Lay public: Highest risk perceptions and lowest benefit or value perceptions toward new breeding technologies. Showed slightly more positive attitudes toward gene edited crops than GM crops.**
- **Experts in other fields: Values similar to experts in molecular biology. Risk perceptions similar to lay public.**
- **Experts in molecular biology: Lowest risk perceptions and highest benefit or value perceptions. Did not differentiate the benefit outcomes of the three technologies.**