



Can Consumers' Beliefs of Genetically Modified (GM) Food Products Advance Food Security in South Africa: Consumers Tell the Truth

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Overview

- Introduction and background to the study
- Problem orientation
- Purpose of the study
- Application of the Expectancy-Value Model of Attitudes
- Methodology of the study
- Main findings in brief
- Conclusion, contribution and recommendation

Introduction and Background to the Study

Compromised food security



- Job losses (Rabbi *et al.* 2021)
- Unemployment (Bozsik *et al.* 2022)
- COVID-19 pandemic (van Wyk & Dlamini 2018)
- Ukraine war influences global food price increase (Hassen & Bilali 2022)
- 2021 SA unrest (Mukwevho 2022)
- 2022, 30 million experience food insecurity every month (Smail 2023)
- 1 in 5 households are food insecure (Dlamini 2023)

Sustainable development goals: Zero Hunger (SDG2)

GM food products



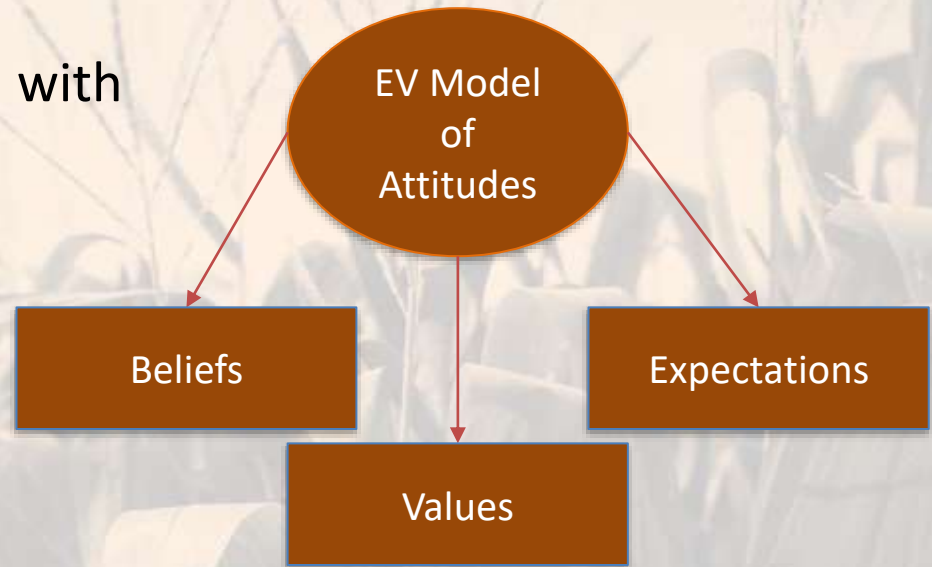
- Pest, disease and weather resistant (Bozsik *et al.* 2022)
- Produce higher crop yields (Shen *et al.* 2022)

Problem Orientation

- ❑ Limited research on consumers' beliefs about GM food products in SA
- ❑ Quantitative approach to the majority of GM-related consumer studies in SA (Kotey *et al.* 2016; Jonker 2017; Gastrow *et al.* 2018)
- ❑ Acceptance, knowledge, attitudes, awareness, and perception on one GM food product, biotechnology, or factors that influence purchase behaviour (Joubert 2002; Pouris 2003; Vermeulen *et al.* 2005; Lanzillotti 2007; Peter & Karodia 2014; Gouse *et al.* 2016; Kotey *et al.* 2016; Jonker 2017; Gastrow *et al.* 2018; Van Zuydam 2020)
- ❑ Consumers could have unfavourable connotations (Popek & Halagarda 2017; Sanlier & Sezgin 2020; Pakseresht *et al.* 2021)

Purpose of the Study

- ❑ Consumers' beliefs about GM food products
- ❑ Insight into attributes associated with GM food products
- ❑ Optimistic or dubious
- ❑ Promote food security
- ❑ Useful tool in SA
- ❑ EV Model of Attitudes – Dr. M. Fishbein (Sheth & Tuncalp 2012)



Methodology

Qualitative Methodology

Constructivist Paradigm

Phenomenology, exploratory and descriptive research design

Purposive, convenience and snowball sampling

32 Participants from the Midlands, KZN

Interviews on Microsoft Teams

Recorded and transcribed verbatim

Thematic analysis: Codes, categories and themes

Open and axial coding

Trustworthiness criteria

Ethics clearance (2021/CAES_HREC/145)

Main Findings in Brief

1

Altered State of Existence

2

GM Crop Production Benefits

3

Consumer-Related Benefits

4

GM Crop Production Risks and Concerns

5

Consumer-Related Risks and Concerns

Altered State of Existence

- ❑ *“it’s foods that have been altered on a genetic level”*
- ❑ *“scientists in a lab”*
- ❑ *“the end products have been tampered with by man”*
- ❑ *“it’s not natural” – Nigeria and USA* (Eneh et al. 2016; Lefebvre et al. 2019)
- ❑ *“sign of the advancement of science”*
- ❑ *“it’s still got a lot to play out and only then, when more is known, will more comfort and solace be found in the application of technology in GM food products”*
- ❑ *“being a Christian, I don’t think you should change things the way God intended them to be”*
- ❑ *“we are playing God when you are altering the genetics of something”*
- ❑ *“it’s not the way God made it”*
- ❑ *“features can be changed”*
- ❑ *“there are definite benefits”*

GM Crop Production Benefits

- ❑ *“more resistant against droughts and floods”*
- ❑ *“pest and disease resistant”*
- ❑ *“been scientifically engineered to improve productivity”*
- ❑ *“have bigger yields”*
- ❑ *“they have the potential to provide food security for untold millions of people”*
- ❑ *“it can feed the world”*
- ❑ *“it’s definitely a way of providing food security and to alleviate hunger in many places”*

Consumer-Related Benefits

- “[GM] foods have higher nutritional value”
- “they are definitely cheaper”
- “as more crops are produced, so the farmer can sell it at a lower rate”
- Literature confirms could be the case (Amin *et al.* 2021; Jiang & Zhang 2021; Sendhil *et al.* 2022)

Improved Aesthetic Properties:

- “more appealing”
- “better colours”
- “are bigger”
- “better quality”

Improved Food Processing Properties:

- “last longer”
- “they taste better”

GM Crop Production Risks and Concerns

- ❑ *“insect population could be affected, which is necessary for pollination in the environment”*
- ❑ *“the modification of some plants means that it reduces the food available for bees” which could be “a problem in our food supply in terms of actually pollinating things”*
- ❑ *“the chemicals sprayed on GM crops are harmful to the ecosystem”*
- ❑ *“it’s going to lead to industrial farming on a different level to the current commercial farming where soil health is neglected”*

GM Crop Production Risks and Concerns

- ❑ *“GM seed is not viable for the next season”*
- ❑ *“you become locked into buying seeds from companies” “such as Monsanto”*
- ❑ *“it’s rather expensive to buy these seeds”*
- ❑ Concerns supported through literature (Bonny 2017; Van Acker et al. 2017; Wray 2021)
- ❑ *“GM seed banks could end up being over-run by one or two large companies”*
- ❑ *“the push is really on making profits and capitalising that”*
- ❑ *“there is a greed behind genetically modifying seed and products”*

Consumer-Related Concerns

- ❑ *“there are potential health effects that it has on human bodies when consuming those foods”*



- ❑ *“people develop more allergies or more severe allergies”*
- ❑ *“it can cause or increase risk for cancer”*
- ❑ Similar fears shown amongst Chinese, USA and Pakistan consumers (Jiang & Fang 2019; Lefebvre *et al.* 2019; Amin *et al.* 2021)
- ❑ *“if you are changing the DNA structures of the things you eat, that can have a ripple effect in essentially degrading our own DNA”*
- ❑ *“in terms of gut health, it would be more difficult for it to process and digest and extract nutrients from something that is genetically modified”*

Contribution and Recommendations

- Contributed by demonstrating the attributes
- Shed light why there is hesitancy toward GM food products
- Important to focus on the beneficial attributes
- Risks and concerns need to be addressed and remedied



- Promote food security in SA
- Achieve SDG2: Zero Hunger
- Influence of beliefs on purchasing

Conclusion of the Study

- Benefits and risks/concerns
- Producing GM crops & consumer
- Optimism & hesitation
- Confusion

- Can GM food products play a prominent role in securing food for the nation?



Thank you

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