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# Multi-stakeholder value creation and appropriation from food-related health claims

Health claims are considered a means to add value to food and beverages; however, it is not always evident which stakeholders benefit and to what extent they benefit. In this paper, we extend the investigation of value creation and appropriation into the domain of food, specifically food labels. Using a qualitative approach, we aimed to elucidate which forms of value can be created by legislating health claims (including those for bioactive compounds found in South African indigenous plants) on food labels. The findings reveal that health claims have the potential to advance the sustainable development agenda in South Africa, but only if structures can be put in place to appropriate human and intellectual (HI) value, as well as environmental value. Currently, there is strong evidence for economic value creation and appropriation potential, but little clear evidence that HI or environmental value will be appropriated from health claims, especially if these health claims exclude benefits from bioactive compounds found in indigenous South African plants. If we could find a means to measure the HI and environmental value creation potential of health claims, using metrics that people understand, we may be able to develop strategies to ensure that such products can benefit stakeholders beyond economic value alone (i.e. more sustainable value creation). The findings could directly impact food labelling policy formulation, considering current draft regulations to implement health claims in South Africa.

**Significance:**

The medicinal plant biodiversity of South Africa offers opportunities for economic, human and intellectual (HI), and environmental value creation through legislated health claims. Without clear metrics for the HI and environmental components, economic value creation may dominate, but the value created might not be sustainable or appropriated by the desired stakeholders. Furthermore, because the current draft legislation for health claims excludes any bioactives from indigenous South African plants, much of the economic, HI and environmental value creation potential reported as potential outcomes for this research (e.g. funds to communities, knowledge preservation or biodiversity conservation) will not materialise.

## Introduction

In South Africa, as in much of the world, the growing incidence of non-communicable diseases (NCDs) is of concern.<sup>1</sup> Key drivers of NCDs are more sedentary lifestyles and changes in the composition of our food.<sup>2-4</sup> Research highlights that, post-1994, South Africans have been eating fewer vegetables and consuming more kilojoules – many derived from sugar-sweetened beverages and processed foods.<sup>5</sup> Not only is there an increase in diabetes-related mortality (7% compared to a global average of 3%)<sup>1</sup>, but also in the challenges of living with such a disease: reduced personal well-being, reduced capacity to work and increased healthcare costs<sup>6-8</sup>.

Food labelling is considered a cost-effective tool in the fight against the rising NCD burden due to the potential it holds to communicate information about the nutritional properties of food.<sup>9</sup> In particular, health claims on food labels can bridge the information gap that exists between the consumer's knowledge and the manufacturers' understanding of the intrinsic qualities of a food product.<sup>10</sup> In South Africa, 'health claim' means an effect on the human body, including an effect on one or more of the following: (1) a biochemical process or outcome; (2) a physiological process or outcome; (3) a functional process or outcome; (4) growth and development; (5) physical performance; (6) mental performance; (7) a disease, disorder or condition; and (8) oral hygiene.<sup>11</sup> There are various means by which to establish such claims. Screening, identification and analysis of functional ingredients, analysis of mechanism of action, and development of agricultural products rich in these functional ingredients is a primary mechanism.<sup>12</sup> Traditional medicinal use is another acknowledged method to establish a health claim, although not widely accepted in food legislation.<sup>13</sup>

Japan is a good example of a country that has tailored food labelling and legislation to achieve better health outcomes and has an established history of allowing foods to carry a range of scientifically validated health claims.<sup>14</sup> Food for Specialised Health Uses (FOSHU) was adopted by the Japanese government in 1991, followed by Food with Nutrient Functional Claims (FNFC) in 2001, and Food with Function Claims (FFC) in 2015.<sup>15</sup> The introduction of FFC unlocked new market growth in a sector that had essentially become stagnant after 2007.<sup>15</sup> One of the first primary processed products for which a claim was allowed was Japanese green tea, produced from the Benifuuki cultivar.<sup>16</sup> In comparison with common green tea, Benifuuki is rich in *O*-methylated catechins, responsible for anti-allergic effects.<sup>17</sup> With the recent expansion of FFC to include selected fresh produce, producers (i.e. farmers) can now also benefit from the system.<sup>12</sup> Examples of FFC fresh produce are  $\beta$ -cryptoxanthin-rich Satsuma mandarins<sup>12</sup> and the corresponding claim "This food contains  $\beta$ -cryptoxanthin, which reportedly maintains bone health; 3 mg/day"<sup>18</sup>.

South African legislation relating to health claims on food is still pending.<sup>11</sup> Claims under consideration include function claims such as "Beta-carotene functions as a tissue antioxidant and so keeps cells healthy" and reduction of disease risk claims such as "Diets low in sodium may reduce the risk of high blood pressure, a disease associated with many risk factors, in some individuals". Notably, there are no claims for plant bioactives such as mangiferin,

aspalathin, and L-canavanine from the South African plants honeybush, rooibos, and *Sutherlandia frutescens*<sup>19-25</sup>, typically consumed as teas and with a long history of traditional use. Bioactive compounds of indigenous plants such as these show promise in preventing and reducing risk factors for NCDs, although human studies are still needed.

Consumers, producers, non-governmental organisations, industry bodies, marketing agents and policymakers (to name but a few) all play a role in influencing food policy.<sup>26</sup> When dealing with such a diverse collection of stakeholders, there are complementarities and trade-offs to consider and, thus, a holistic view of value creation and appropriation from the perspective of these stakeholders could provide the ability to maximise the value 'pie' that can be created from food labels. This study examines the types of value that can be created by putting health claims on food labels in South Africa (including claims related to bioactives from indigenous plants). It also outlines the stakeholders for which value can be created and where it might be captured.

## Methods

### Study design and setting and recruitment

A pragmatic paradigm was used to answer the research question.<sup>27</sup> To gain an in-depth understanding of potential value creation, in-depth qualitative interviews were conducted with a focused sample. The aim was not to make generalisations about the views of a larger population.<sup>27</sup> The study was conducted in accordance with the Declaration of Helsinki, and approved by the Research Ethics Committee of Stellenbosch University (FESCAGRI-2020-11491) prior to commencement of the research. Respondents provided informed consent before the start of the interviews. They were thanked for their contribution, but not compensated. Professionals were specifically recruited for their diverse professional qualifications to achieve maximum variation in perspectives. Professional contacts of the lead author were approached initially, followed by snowball sampling (accounting for approximately 50% of respondents). Consumer respondents were approached via Facebook through direct messaging based on their ability to inform the research question. A deliberate effort was made to exclude consumers who worked in the food or healthcare industries.

### Procedure

Prior to the interviews, the interview guide was tested with a convenience sample of three professionals. All interviews, typically 45–60 min long, were conducted in English via video conferencing between February and May 2020. Respondents were asked to share their views on what type of value could be created by incorporating health claims on food labels in South Africa. Based on their responses, follow-up questions, such as "What other benefits are there from food labels, and who benefits from them?" were asked to gain additional insight or clarity. Interviews were conducted until theoretical saturation was achieved<sup>28</sup>, i.e. when no new insights emerged from interviews.

### Data analysis and trustworthiness

The interviews were audio recorded, transcribed and coded (i.e. names assigned to segments of the interview transcripts, based on the content). The six capitals model of the International Integrated Reporting Council<sup>29</sup> was used as an initial guide to identify forms of value reported by participants<sup>30</sup>. Thematic analysis was performed<sup>31</sup> whereby codes were arranged into groups with similar themes, resulting in three final themes pertaining to value creation through health claims on food labels. Trustworthiness was ensured through the process of respondent validation (also known as member checking)<sup>32,33</sup> and by ensuring a clear audit trail<sup>34</sup>.

## Results

### Study sample characteristics

A total of 49 interviews were conducted with food-related professionals accounting for 35% ( $n = 13$ ) of the professional sample, healthcare-related professionals for 32.5% ( $n = 12$ ) and professionals not associated with either industry ( $n = 12$ ). Details of the professional respondents, including potential conflicts of interest, are provided in

Supplementary table 1. Furthermore, 12 consumer respondents were interviewed; 7 of the 12 consumer respondents had a B-degree, while 4 had a postgraduate qualification.

### Value creation by food labels incorporating health claims

Respondents initially struggled to answer the question, "What forms of value do you think can be created by including health claims (including indigenous health claims) on food labels?" Better responses were obtained by rephrasing the question and replacing the term 'value' with 'benefits'.

Using thematic analysis, we found support that food labels bearing scientifically validated health claims could add value in three domains – namely economic, human and intellectual (HI) and environmental – for a range of stakeholders including farmers or producers, businesses, government, individuals, communities, and society at large. It is important to note that health claims are both a manifestation of, and tool for, transferring 'knowledge value'. This was captured as intellectual value, incorporated into HI value.

Economic, HI and environmental benefits did not receive equal mention (Table 1). Overall, the majority of respondents ( $n = 38$ ; 77.6%) believe that food labels with health claims could generate economic value. Only two respondents (4.1%) directly highlighted environmental benefits, whilst approximately half of the respondents ( $n = 27$ ; 55.1%) felt that health claims could create HI benefits. Some respondents mentioned broader HI and environmental benefits associated with labelling in general, but they did not explicitly link these to the presence of health claims. These are reflected as indirect mentions in Table 1. Illustrative quotes used to identify the value domains are available in Supplementary tables 2–4.

### Economic value

Most respondents considered the value creation potential of food labels with health claims to be primarily economic in nature but appropriated by different stakeholders.

### Farmers, producers and businesses

Health claims were predominantly considered to benefit (in terms of economic value) businesses such as food manufacturers due to the commercial opportunity they present (P17). This relates specifically to opportunities to develop new products with claims that will drive product differentiation and enhance desirability – ultimately leading to increased sales or higher prices (P33, P13, P14, P21).

Health claims, according to Respondent P24, would increase product appeal on the international market (thereby boosting market growth), as well as allow *producers* to charge higher prices for their products and generate higher profits. This was felt to be especially relevant when communities are highlighted as beneficiaries (P24), as consumers enjoy supporting such initiatives. Whilst respondents agreed that health claims could generate economic benefits for businesses, several raised concerns about whether such benefits would be evenly distributed between smaller and larger enterprises (P37) (i.e. appropriation bias to larger players).

Respondent E9 echoed the possibility of higher profits for all stakeholders in the value chain, starting with farmers and producers. Respondent P12 indicated that plant breeders could benefit economically (financially) from the cultivation of specific plants with desirable properties (including substances that could be used to make health claims).

Finally, several respondents highlighted that the government would need to be wary of unscrupulous manufacturers and marketers who might make unsubstantiated claims to defraud consumers simply to make profits. The quote from Respondent C3 is illustrative:

*If I think about the average person, if you make a claim, it will probably create a hype and excitement and people will make decisions based on that [substance] being in a product... It's hard for a consumer to know whether it's a marketing claim or a scientific claim...I think there's too much chance of corruption...*

**Table 1:** The percentage of respondents who mentioned economic, human and intellectual or environmental value for food labels with health claims

Respondent		Economic	Human and intellectual	Environmental
<b>Yes</b>				
Not food nor healthcare industry	(n = 12)	10	7	1
Food industry or related*	(n = 13)	8	12	1
Healthcare industry or related*	(n = 12)	11	6	0
Consumers	(n = 12)	9	2	0
<b>Sub-total "Yes"</b>	<b>(n = 49)</b>	<b>38 (77.6%)</b>	<b>27 (55.1%)</b>	<b>2 (4.1%)</b>
<b>Indirect</b>				
Not food nor healthcare industry	(n = 12)	0	1	2
Food industry or related*	(n = 13)	0	0	6
Healthcare industry or related*	(n = 12)	0	0	1
Consumers	(n = 12)	0	2	2
<b>Sub-total "Indirect"</b>	<b>(n = 49)</b>	<b>0 (0%)</b>	<b>3 (6.1%)</b>	<b>11 (22.4%)</b>
<b>No mention</b>				
Not food nor healthcare industry	(n = 12)	2	4	9
Food industry or related*	(n = 13)	5	1	6
Healthcare industry or related*	(n = 12)	1	6	11
Consumers	(n = 12)	3	8	10
<b>Sub-total "No mention"</b>	<b>(n = 49)</b>	<b>11 (22.4%)</b>	<b>19 (38.8%)</b>	<b>36 (73.5%)</b>
TOTAL		49	49	49

\*One respondent worked in both the food industry and the healthcare industry; we counted the respondent in the healthcare group.

## Government

The key anticipated economic value that can be created by health claims would be a healthier public (P33), which spills over into economic value in the form of reduced healthcare spending for *governments*. If the public is not healthy, costs escalate, as articulated by P34:

*If our diabetics and hypertensives [i.e. hypertensive patients] are on treatment but they are very unhealthy and these conditions are poorly controlled, they cost us more money. They cost everybody else more money because of how medical schemes work - the healthy people subsidise the sick people. So, if you have more sick people, then the contributions go up, and we spend more on health, and the cost of health care just keeps going up, and up, and up.*

## Individuals, communities, and society at large

Links to economic value for *individual consumers* that can be derived from health claims were limited. Respondent P17 alluded to the idea that if consumers appropriately use health claim information, it could presumably lead to better health and more efficient spending (i.e. reduced personal financial health burden). This benefit, however, is not necessarily available to all. Respondent P27 highlighted that healthier products, including those with claims, frequently come at a higher cost to individual consumers, limiting the ability of lower-income consumers to reap such benefits. Respondent P37 also highlighted an important caveat for the appropriation of economic value to individuals:

*It really adds to the tools that you have at your disposal... to use labels to educate clients and patients. But it is within the limitations of saying that it is more your well-educated consumer that it will benefit, and it will probably not benefit the others [less educated consumers] because it will just make it more confusing.*

*Communities* were highlighted as a potential beneficiary of economic value only in cases where the health claims were derived from indigenous knowledge (P12) and the source material is grown in such communities. In such cases, government protocols must be in place to guarantee that communities benefit. Respondent P11 expressed concerns around long-term monitoring and evaluation of such benefits, citing past challenges with Fairtrade rooibos where small-scale farmers did not experience all the anticipated benefits due to the greater efficiency of larger-scale farmers.

Through healthier choices, *individuals* can also influence the market in the longer term and make healthier choices the more economical choices for *society*: "If we start seeing a shift towards healthier foods, then economies of scale will drive down the costs and the unhealthy ones will become less popular." [C5]

## Human and intellectual value

Health claims have the potential to create HI value for individual consumers if consumers read the food label, interpret the information and then use the information to make food-based decisions that benefit their health (P27, P24, P13, P17). Apart from the economic benefit of better health described in the previous section, good health has value in itself in the form of quality of life, happiness, longevity, etc.

Whilst HI value of health cannot be appropriated by business (as it is a public good), it can be appropriated at an individual level in the form of increased (individual) knowledge about the benefits of products (due to claims). Respondent P16 spoke of the health platform that is well established for cranberries and the prevention of urinary tract disorders (i.e. when consumers understand the benefit and this drives its demand). Health platforms, as a result of knowledge gain, result in economic value.

The potential for the sharing and preservation of traditional knowledge is an interesting result from the interviews, although only one respondent (P12) was able to expound on this. She emphasised the need for preserving such knowledge because younger generations are not always interested in doing so, and the knowledge may be lost as a result. Furthermore, Respondents P12 and P16 stated that applying this knowledge could result in economic benefits for communities by creating jobs (due to the cultivation of indigenous plants). However, concern was expressed about the materialisation and management of such benefits (Respondent P12, Supplementary table 3).

### Environmental value

Overall, respondents made very little mention of the potential for health claims to create environmental value. Although two respondents (P18 and P19) pointed out that smaller businesses can differentiate their products by demonstrating greater care for the environment, they did not link this directly to health claims. The most significant references to environmental value from health claims concerned biodiversity preservation. Respondent P13, an entrepreneur and marketer of indigenous teas, explained how communities are preventing indigenous trees from becoming firewood, and protecting them from 'parasites', so that the leaves might be sold to her tea company. Her teas are widely linked to various health benefits based on traditional knowledge, although she does not make direct health claims on her products. Similarly, Respondent P12 shared insights into how traditional healers are cultivating the plants used in their traditional herbal remedies, thereby contributing to biodiversity preservation. Respondent P25, using Fairtrade as an example, pointed out that, due to various governance and certification procedures (and the cost involved), such programmes do not represent the majority of products on the shelf and therefore their total impact is limited.

### Integrated view of value creation

Based on interview responses, the key value creation 'mechanisms' from food labels with health claims, when such health claims are derived from indigenous products, were integrated into a system diagram (Figure 1). Reinforcing loop R1 shows that the consumption of products with health claims can lead to increased demand for such products, enticing farmers to cultivate indigenous crops, thereby increasing industry capacity, as well as subsequent supply. Increased supply generally has an inverse impact on product cost, hence the cost of such products could reduce in the longer term. In the short term, however, the higher cost of products with health claims would limit their consumption. As highlighted by respondents, economic, HI and environmental value may be created throughout this process, but the stakeholders appropriating the value do not remain constant. This is discussed further in the next section.

Reinforcing loop R2 shows that the consumption of products with health claims can improve personal health, potentially reducing the personal financial burden of ill health, and increasing expendable income. This additional expendable income can presumably also be spent on products with health claims, thus driving consumption (feeding into R1). At the population level, improved personal health drives the proportion of the public that are healthy, which would reduce the public health burden (assuming real health benefits are attained from the consumption of food products with health claims). Finally, reinforcing loop R3 illustrates that the demand for products with health claims can drive investment in research, increasing the level of proof for the health benefits of indigenous products, as well as driving consumption. In the process, indigenous knowledge is preserved.

### Discussion

How, by whom, and for whom value is created are three perspectives on value that can influence food policymakers' decisions, and yet are poorly described in food labelling policy literature. Based on the interviews conducted, South Africa's biodiversity presents an opportunity for economic, HI and environmental value creation through health claims. However, the distribution across these domains is not equal. Health claims are only perceived as positive by specific target

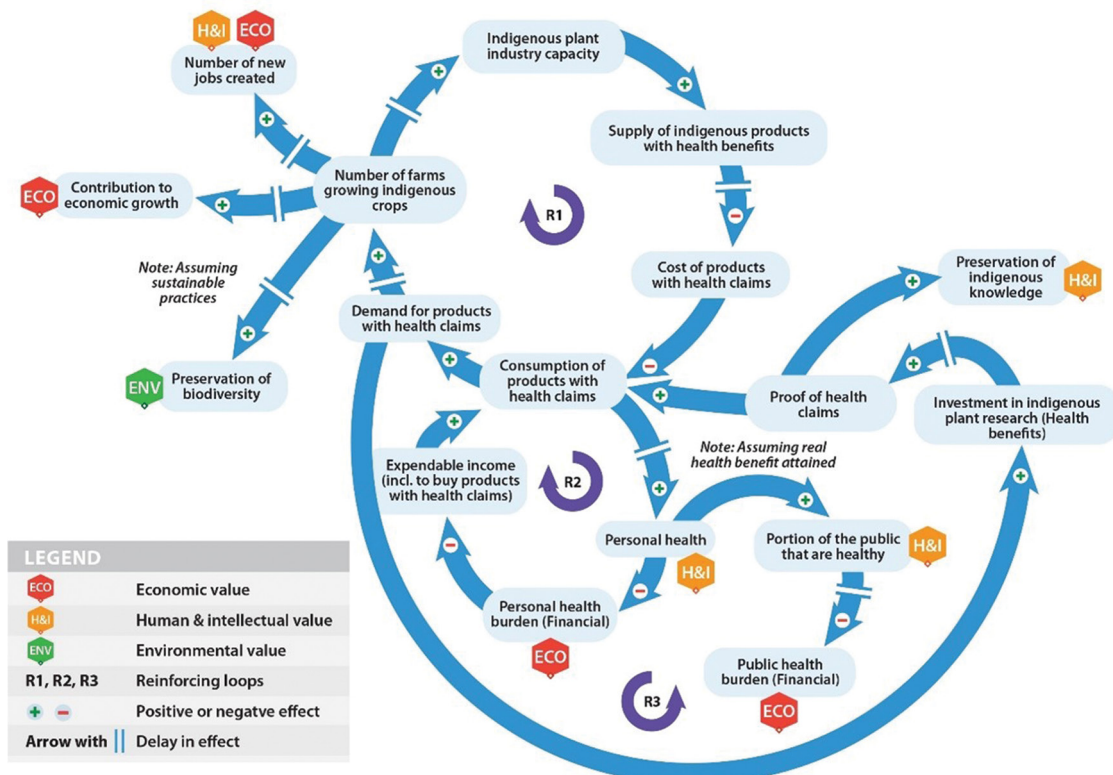


Figure 1: Systems diagram illustrating the economic, human and intellectual, and environmental value creation potential of food products with health claims.

consumers – those who need the product, understand the benefit, and can afford it. Similar findings exist in the literature<sup>35</sup>; but what is pertinent for South Africa, is that these customers appear to be from higher-income and better-educated demographics, which are at odds with where benefits are most needed (i.e. in the lower-income groups who are less educated and largely reliant on public health). So, whilst health claims can generate economic value for plant breeders, farmers, communities, and businesses, achieving that value may conflict with the HI value creation of making the wider society healthier. The wider public may be able to reap the HI value (health benefit) if individuals with greater purchasing power can push demand to the point where prices of products with health claims fall; however, this could be at the expense of farmers, communities, and businesses. In other words, in the longer term, value could slip (i.e. when value is created by one source but captured by another<sup>36</sup>) from the plant breeders, farmers, communities and businesses to the public.

A further challenge to value creation from health claims emanates from the question of whether consumers will understand the health claims, or what format they must take to sway consumer purchase decisions (assuming they can afford the product). Health claim formats have not been researched in South Africa. The increasing amount of information on food labels increases the complexity of consumer decision-making and can result in greater consumer scepticism toward food labels.<sup>37</sup> Furthermore, we know that consumers are likely to receive the same claims differently based on their pre-established networks and beliefs.<sup>38</sup> We also know that food labels (without health claims) are not well understood under current circumstances in South Africa<sup>39</sup>, so adding more information might not have the desired effect, i.e. of enhancing knowledge and health.

In the long run, health claims may lead to an increase in the number of 'health platforms', as more customers become aware of the benefits of specific products, thereby driving sales. This raises the question of how to create and grow such health platforms. One approach to accomplish this could be through marketing by businesses that have conducted the research or have access to research. Despite respondents in this study being sceptical about the motivation of companies making health claims (i.e. only to make money), we need to acknowledge that such companies represent one lever that can be used to establish 'health platforms' that can ultimately benefit the public.

The cost and time associated with validating health claims may be prohibitive for smaller players, and thus to benefit more stakeholders, the government would need to step in and make the research available to all. This is the situation in Japan with FFC.<sup>12</sup> South Africa, unlike Japan, does not have approved health claims, so whilst the government's bio-economy strategy<sup>40</sup> is already driving research on various indigenous plants and other areas, it could be considered a waste of resources if claims are not legally permitted (i.e. value is not captured).

Without health claims, consumers cannot learn of benefits; knowledge cannot grow, be shared or preserved; 'health platforms' cannot form; fewer products may be sold; and thus little to none of the economic, HI or environmental value will be realised. This highlights the need to reconsider how health claims could be verified and implemented in South Africa. The Japanese FFC model might be the most advantageous to investigate for possible implementation in South Africa, bearing cultural differences in mind.

Various Fairtrade and other studies have shown that when products for the mainstream market are derived from communities that have never before participated in the economy, such trade has the potential to create jobs and address HI challenges related to poverty.<sup>41-43</sup> The signing of the Rooibos Benefit Sharing Agreement in South Africa is a local example of international significance that has for the first time led to funding streams for indigenous communities.<sup>44</sup>

There is little doubt that health information about specific food products would enhance their sale and use – as highlighted by Respondent P16 in his reference to the urinary tract 'health platform' for cranberries. Rooibos has benefitted from global demand and

distribution due to its perceived health benefits<sup>20</sup>, although no such claims are presently allowed. More human studies substantiating the health benefits of rooibos are required.<sup>45</sup> Care should be taken, if health claims are legislated, that sustainable value is created for multiple stakeholders rather than benefitting a few (as was the case in the past with rooibos).<sup>46</sup>

Whilst environmental value can be created by labelling initiatives<sup>43</sup>, the present study highlights two key challenges. Firstly, there is a low awareness of the environmental value creation potential of health claims. Consumers in South Africa often struggle to identify environmentally friendly goods and are unable to verify the environmental claims made by these goods.<sup>47</sup> Secondly, the costs of verifying the environmental value could hamper the benefits. Without claims, there would be lower demand and less incentive to cultivate indigenous plants, reducing the potential for biodiversity preservation.<sup>48,49</sup>

Lastly, health claims provide an opportunity to conserve knowledge, as well as the possibility to create new knowledge as a result of further research.<sup>50</sup> Because of cost and time, it may be necessary to adopt a more innovative strategy, such as the formation of industry bodies that can undertake research and disseminate the results to all stakeholders, big and small. In Japan, the government coordinates knowledge generation and dissemination<sup>51</sup>, but in a country with limited resources, such as South Africa, private-public partnerships would be needed.

## Limitations

Given the qualitative methodology, the study remains explorative. Nevertheless, it can serve as a starting point for more research into long-term value creation from food labels with health claims or any other health-related on-pack mechanisms.

## Conclusion

While the economic value creation potential of incorporating health claims on food labels already appears to be fairly well understood, the findings clearly indicate that more work is needed to close the gaps in understanding how HI and environmental value can be captured. If this is not done, the introduction of health claims is unlikely to deliver sustainable value for multiple stakeholders. This research also highlights a paradox: by boosting economic value for stakeholders such as producers, communities, and enterprises (increased demand and pricing, driven by health claims), a large percentage of the general population may be excluded from the benefit of better health. That is, without additional interventions, the wealthier and better educated in South Africa may be the only ones who improve their health. Of final concern is the fragmented approach to research on indigenous and other products, as value can only be fully appropriated if health claims can be made. There are opportunities for long-term value creation, but more research is needed for a deeper understanding of what barriers exist and how to overcome them.

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## Competing interests

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper. The associations of respondents to the food- and healthcare-related industries have been clearly identified.

## Authors' contributions

M.T.: Conceptualisation; methodology; investigation; data curation; visualisation; formal analysis; writing – original draft. J.V.: Writing – reviewing and editing; methodology; visualisation. E.J.: Funding acquisition; supervision, project administration; writing – reviewing and editing.



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