BLOCKCHAIN ENCRYPTION OF SUPPLY CHAINS AND ANIMAL WELFARE CUES AND THEIR IMPACT ON CONSUMERS' ASSESSMENT OF HIGH-QUALITY MEAT*

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Worldwide, around 337.2 million tons of meat were produced in 2020, a 45% increase since the year 2000. However, in many countries, there is also a trend towards conscious meat consumption, explained by consumers' increasing quality orientation, sustainability and animal welfare concerns (Aboah & Lees, 2020; Tandon et al., 2020). To uphold consumer trust, transparency and authentication of claims in the food supply chain are increasingly important (Janssen & Hamm., 2012; Kehlbacher et al., 2012; Grunert et al., 2015)).

Blockchain, as a new digital technology, seeks to enhance the transparency of supply chains (Treiblmaier & Petrozhitskaya, 2023) by providing an immutable record of transactions, allowing real-time viewing and tracking of goods and information. Crucially, data encryption makes the blockchain tamperproof: All committed transactions are stored in blocks, each with a unique digital signature (Queiroz et al., 2020; Kouhizadeh & Sarkis, 2018). Accuracy is vital, since inaccuracies entered at the first step are passed through the blockchain. Encryption cannot completely prevent criminal misuse but, as the encrypted information is permanently stored and cannot be overwritten, it does offer greater protection against fraud (Singh & Sharma, 2023; Tan & Saraniemi, 2022).

Consumers may be more or less familiar with the technology. Some, however, might associate blockchain with cryptocurrencies, which are often viewed with suspicion (Janssen et al., 2020). Our study considers how to design the blockchain technology reference on product packaging (as an extrinsic cue) to appeal to consumers, while controlling for potential aversion effects.

The widespread use of (complicated) expert terminology suggests that such language is associated with trustworthiness in today's complex global food system (Rupprecht et al., 2020). However, the rationale for this effect may be different: Consumers familiar with blockchain may perceive the scientific language as acknowledging their expertise and view it as a strong argument (Dodds et al., 2008). But consumers unfamiliar with the deeper theoretical background of blockchain, we assume, view such scientific cues as peripheral stimuli that are processed quickly, without cognitive effort (Fowler et al., 2019), considering them meaningful or innovative without understanding the content. Simply put, these consumers trust the expert description just because it sounds scientific. Therefore,

we assume (H1) that, irrespective of familiarity with the technology, scientific-sounding, expert descriptions of the blockchain principle increase trust in this technology and its stored information more than lay descriptions that prioritize understandability over technical accuracy. Increased trust in supply chain information consequently enhances anticipated overall quality and purchase intentions.

Several studies in the field of advertising have found that emotive appeals outperform factual appeals (Guitart & Stremersch, 2021; Geuens et al., 2011), making emotive messages key in contributing to attitude change. Since animal welfare is an issue that resonates deeply with many consumers (Feinberg et al., 2019), wording that evokes emotional reactions, such as emphasizing the animal's happy life, may have a more positive impact than factual, objective wording (such as referring to the meat as a 'product'). Emotive appeals also provide the impetus for cognitive engagement (e.g., checking other quality seals). Consumers with high interest in animal welfare want to be sure they can rely on, for example, the welfare standards declared. By focusing on emotive cues (vs. factual) related to animal welfare, we assume (H2) that consumers perceive the overall quality more favorably, ultimately increasing purchase intention.

The dual process model HSM posits that the two modes of information processing can occur concurrently (Chaiken, 1980), meaning that central and peripheral stimuli can strengthen each other (or mutually attenuate, which is irrelevant here). We assume (H3) that if both paths of the HSM are activated via the expert description and the emotive welfare appeal, an interaction effect should occur, so the combination of expert description and emotive cue will be more effective regarding the dependent variables than all other combinations.

Empirical investigation and results: Participants of our online study whose measured response time was so short (less than one-third of the time determined by Qualtrics) that careless responding must be inferred were excluded, as well as vegetarians (final sample=398).

Interestingly, use of the buzzword "blockchain" does not create any negative reactions. We found no aversion effect to the term (via a comparison of identical slogans with vs. without the term). Second, we learned that objectively high knowledge about blockchain (vs. low, measured with a knowledge test) has no impact on the evaluation of blockchain labels.

Results and discussion: We found two main effects: (1) The expert description of blockchain evokes higher levels of trust in the supply chain information, overall (ecological) quality perception, and purchase intention. As knowledge of blockchain technology plays no role, it can be assumed that the expert description works for those who understand blockchain because it aligns with their knowledge, while the uninformed trust the description because it sounds scientifically accurate. (2) Emotive animal welfare cues were found to be more effective than factual ones. The animal lover is appealed to when the animal was happy (challenging the "meat paradox" literature). Additionally, although no significant interaction effects can be observed, the combination of emotive cue and expert description tends to increase trust and quality perception.

Our study is one of the first investigating the design of the extrinsic cue "blockchain." However, it has limitations, such as being conducted online and not accounting for other extrinsic cues at the POS where decisions are mostly made in a few seconds. We acknowledge the importance of POS studies. Even though our test subjects attributed a very high degree of realism to the manipulated product packaging, meat is normally sold in stationary retail (not online), so a POS study is needed (with

actual sales data) to validate our results. We kept the price constant for the packaging but, in reality, customers have opportunities for comparison. The novelty effect of blockchain technology should also be kept in mind – the technology is still quite young and fascinates many people. In a few years, this may have subsided. The question also arises as to how such information works at the deli counter, where unpacked meat is presented.

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