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Funny myth busting: Are humorous messages effective at correcting misinformation regarding food safety?

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“It was the best of times, it was the worst of times...” - Charles Dickens

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Abstract

Food safety misinformation is highly prevalent among the population and could potentially be increased by individuals efforts reduce waste, and stakeholders promoting efforts such as

The present body of literature has provided insight in the “art” of correcting misinformation in many different topics. However, the topic of food safety has not received such attention. This paper aims to explore the effectiveness corrective messages has on correcting misinformation on a food myth. The study moreover looks into the tone of the message (humorous and non-humorous) and endorser type (expert vs celebrity) is able to correct a current held misinformation.

Using a mixed experimental design with between- and within subjects variables, repeated measures ANOVA analysis reveal that the the corrective information is successful in adjusting participants ($n = 157$) belief in the food safety myth. However, the current study is not able to provide proof that a humorous correction differs in effectiveness from a non-humorous correcting. Likewise, for endorser type (celebrity vs expert) no significant difference in misinformation correction is found. Lastly, there are no significant differences in corrective effectiveness when comparing humorous and non-humorous messages with expert and celebrity endorsers. However there are tendencies in the data that indicates at marginally insignificant level that the combination expert endorser and non-humorous message is more effective myth buster.

“Men occasionally stumble over the truth, but most of them pick themselves up and hurry off as if nothing ever happened.”

- **Winston Churchill**

1.0 Introduction

Humans have a substantial amount of information stored not based on information from scientific journals. While some of these misconceptions are trivial, others can cause sickness, death, financial trouble and be a threat to democracy (Lewandowsky et al. 2012; Cook et al. 2015). Correcting these wrong beliefs are therefore important. Not only for the ones who are in the wrong, but for the society and those around that risk paying the price of others misinformation. The continued belief and refusal to correct misinformation has for instance, given room for previously eradicated diseases such as polio to *blossom* again (Lewandowsky et. al 2012). However, correcting already accepted information is a proven difficult task.

The research on correcting misinformation has looked at several different strategies for correcting myths in many different settings, with varying degrees of effectiveness (Walter and Murphy 2018). However, there has been little research that looks into correcting misinformation about food safety - a topic full of myths and misinformation. Even though food safety is an increasingly important public health issue. (Røssvoll et al. 2013), there are still safety breaches on both industrial and consumer level. In Europe alone, approximately 5000 die every year and 23 million get sick from the food they eat (Safeconsume 2018) and approximately 30-40% of *these* stems from food cooked in their own home (Safeconsume 2018). The importance of informing the consumer of correct food safety measures is high since actions at a consumer level (storing, preparing etc. in house) can atone for errors at earlier stages (e.g. production or convenience store level), and perhaps more commonly, they can reversely abolish the existing safety precautions (Røssvoll et al. 2013). One of the reasons why people fail to safely cook food is the existence of myths and misinformation regarding food safety.

This paper aims to investigate the myth that that you can trust your senses and see, smell or taste if a food is safe to eat. This particular misconception has seemingly received more attention in the past years, as environmental concerns increase and ways for individuals to reduce emissions are advertised. According to Project Drawdown, a project that measures the most effective solutions to the climate challenges, the third most important action we can do to reduce climate gases is

reduce food waste (Drawdown.com). While reducing food waste is good for both the environment and the consumers bank accounts, this focus could have unintentional negative effects for the food safety. This apparent growth in interest of saving food has also induced the creation of apps such as TooGoodToGo.com, *where restaurants can give or sell their leftover produce at a discount*. People and pages such as “Eat your food” (norwegian: Spis opp maten!) on instagram also plead to people that they should not trust the dates on the packaging and rather see, smell and taste for them self to see if the food is eatable or not

Moreover, as a response to consumers desire to waste less, companies are starting to adapt by for instance adjusting their expiration date. Norwegian dairy produced Q changed their dating from saying “Best before” to “Best before, but not bad after” (Q-meieriene.no), shortly followed by their main competitor, TINE (Aftenposten 2018). They also have dedicated sites encouraging consumers to use their senses before throwing away the food or drinks (Q-meieriene.no, 2). The urge to use your senses is also promoted by other actors such as Oslo Green Capital of the Year, who in regards to date markings urges consumers to “take it with a pinch of salt” (Miljøhovedstaden.no). Similarly does also Matprat.no (2019), a food recipe site created by “The Information Office for Eggs and Meat”, giving consumers advice on how to use your senses to evaluate food safety levels.

The widespread belief and seemingly increasing promotion of this misinformation, requires effective communication aimed at correcting the false belief. Moreover, exploring the different message qualities that can lead to higher acceptance of corrections is therefore important. This paper will do so, by applying two of advertisements most commonly used and seemingly effective appeals: Celebrity endorsement and humor (Knoll & Matthes 2016; Eisend 2009)

1.2 Broad research questions

How does the use of humor in a message (and celebrity/expert) affect the ability to correct misinformation (regarding food safety).

1. *Do corrective messages, and to which extent, reduce misinformation and falsy held beliefs regarding food safety?*
2. *Are corrective messages with a humorous tone more effective at corrective misinformation?*
3. *What role does the endorser type play, and can both celebrities and experts use humor in corrective messages?*

1.3 Structure of paper

The author will first present the existing relevant literature on the subjects of correcting misinformation, humor and celebrity endorsement, and their potential in corrective communication. Hypotheses will be proposed after the relevant theory is presented. A method section follows, where these hypotheses are tested. The results from these test are presented and discussed, future research and limitations.

2.0 Literature review

2.1 Myths and misinformation

The most widespread word is misinformation, which can be defined as “*Information that is presumed to be true at encoding but later on turns out to be false*” (Ecker et. al 2011). This is a fairly simple definition, but it captures the essence of the phenomena. To slightly broaden the concept, we can also include another definition of misinformation: “*Cases in which people’s beliefs about factual matters are not supported by clear evidence and expert opinion*” (Nyhan & Reifler 2010 p 305, in Walter and Murphy 2018). Furthermore, this paper will look at myths, which can be defined as “an invented story, idea and concept” (<https://www.dictionary.com/browse/myth>). Moreover, myths are seen as one of the biggest sources of misinformation and being generally hard to correct (Cook et. al 2015). Thus, a myth is a way that misinformation can occur. Therefore, this paper will therefore use the words accordingly. It will also use the term “Corrective messaging”. This has, to the best of my knowledge not been defined, however, it will in this paper describe a message or mean of communication where the goal is to correct a currently held (false) belief.

2.1.1 Correction of misinformation

Corrective messages are usually categorized into strategies that targets either consensus, coherence, source credibility, fact-checking or general warnings (Walter and Murphy 2018). It is a topic that is researched in the field of communication, as well as on a biological level by analyzing how we encode, store and override information in our brain (Ecker et al. 2011).

As incorrect information can occur in all kinds of different settings and scenarios, the act of correcting such information is therefore also important in all kinds of topics. This is reflected in the broad range of context in which studies on the topic has been conducted (Nyhan & Reifler; Moyer-Gusé, Robinson & McKnight 2018; Lewandowski et al. 2012)

Moreover, it is necessary to test corrections in the different topics, context and settings, due to the fact that these differences yields different results (Walter & Murphy 2012).

2.1.2 The effects of correcting myths and misinformation

The effects of correcting misinformation has been fairly well documented through several different contexts, and we have a good overview of the possible pitfalls in doing so. The main issue is that it is easier for people to encode original information than it is to correct existing information (Ecker et al 2011), which is seen as a hard task. Though there are research papers that shown the ineffectiveness that corrective information has on people false beliefs (e.g. Lewandowsky et al. 2012), a meta study by Walter and Murphy (2018), found that corrective messages overall had a moderate effect on the belief of the misinformation. Meaning that overall, correcting misinformation works. Furthermore, they also conclude that misinformation in real life settings are harder to correct than constructed misinformation. This is due to the fact that by using real life scenarios, people will often have a pre-existing opinion on the subject, e.g. political standpoint. This will need to be debiased in order to get the people to accept the new information, while no such thing exist in a made up scenario (Lewandowsky et al. 2012). In the context of accepting or rejecting information this plays a role given that we all hold different opinions initially and we will therefore adjust that belief, either upwards or downwards when we are exposed to the information (Anderson 1981 in Taber and Lodge 2006). Moreover, giving forewarnings that information you are about to receive can be incorrect, are less effective than giving correctional information afterwards, and that fact checking and messages targeted towards credibility are less effective than corrective information with focus on coherence (Walter and Murphy 2018).

2.1.3 Continued influence effect

Even though it can be said that corrections have some effect, they very seldom manage to remove the misinformation completely. This means that people, even after acknowledging a correction, are affected by the initial misinformation (Lewandowsky

et al. 2012). This has been called the Continued Influence Effect (CIE), and is highly prevalent in the existing literature across various disciplines (Lewandowsky et al. 2012; Ecker, Lewandowsky & Tang 2010). This effect is also referred to as a belief echo, indicating that old beliefs will still be heard after correction has been presented (Thorson 2016). As a result, expectations regarding the effect a correction has should be limited to a reduction of belief, not a complete removal. As a consequence, this paper holds a general notion that the effectiveness of the corrective message is not dependent on complete removal of belief.

2.1.4 Cognitive processes - System 1 and system 2 corrections

While it might intuitively think that having more interest, knowledge and overall devoting more time and effort to information will increase the acceptance for it, there is little empirical research to back this up (Schwarz et al. 2007). In fact, in terms of effectiveness of corrective messages, interest and knowledge has been shown to decrease the effect of corrective information (Nyhan et al. 2013; Nyhan & Reifler 2014). Furthermore, we also see several examples of corrections have the complete opposite effect than intended. For instance, the intent to vaccinate against the flu went down for those with high safety concerns after being given corrective information (Nyhan & Reifler 2014). Moreover, in a political setting, people with little political knowledge were more likely to accept a correction of misinformation on health care, while those who were high in political knowledge in fact only reinforced their initial beliefs (Nyhan et al. 2013). Moreover, when we face information that goes against our initial belief rather than confirms it, people become “Motivated skeptics” (Kunda 1990). This term refers to the fact that people do not become skeptic of information when it matches their hypothesis, while they do become skeptic when they are exposed contrary information, engaging more actively in counter arguing (Taber and Lodge 2006). Thus, the intentions of an individual is often not to find the objective truth, but rather protect itself from new information that violates existing beliefs systems and cause cognitive dissonance, and potentially creating backfire effects (Young et al. 2018; Lewandowski et al. 2012) The implication of these findings, is that high knowledge and interest in people can lead to less willingness to accept the correcting and adjust their views (Nyhan et al. 2013).

These findings can also be supported by the research of Kahneman and Tversky on “system 1 and system 2” (Kahneman 2013). They suggest our brain uses two different systems for handling information and making decisions:

- System 1 - an intuitive, fast and automatic way of coping with information.
- System 2 - a slower, effortful and a more advanced way of coping with information

(Kahneman 2013).

Since the use of system 2 is effortful, we try to use it as little as possible, and rather rely on the heuristics of system 1. Furthermore, when people are in a happy mood, they become more reliant on their system 1, thus, trusting more their intuition. On the other hand, when they are in a less happy mood they are more likely to activate their system 2, causing them to be more skeptic, analytical and suspicious (Kahneman 2013). For corrective messages this means that that activating system 2 leads to the somewhat counterintuitive notion that using more brainpower to process the message, leads to higher likelihood of rejection (or even strengthening of original belief).

However, there are also indications that those who rely more on their intuition are more susceptible to having alternative beliefs in general, compared to those who reason more (**Aarnio and Lindeman 2004**). Though, according to Lewandowsky et al (2012), people who have accepted misinformation through a system 1 process, will react better to correctional efforts than those who have had a more thorough thought process. It is apparently therefore both easier to get misinformed but also easier to correct the misinformation through system 1, and likewise harder through system 2 processes. Therefore, investigating corrective communication strategies that target system 1 processes are of interest.

2.1.5 Food myths/correctional messages in a food setting

While there is not too much research that has focused on correcting food myths, there are some results, which seems to be consistent with the results from other fields. For instance, a study by **Olsen (2016)** showed that giving pro-organic people evidence of their beliefs being incorrect, did in fact not change their attitudes towards organic food. Furthermore, there are indications that debunking myths is better than

promotions to encourage adoption of new foods (Wansink et al. 2014). Lastly, and perhaps a bit surprisingly, by comparing different degrees of emotion regarding reasons why a plane crashed, Ecker et al (2010) by letting the reason be either terrorist or bad weather, the researchers concluded that emotion had no impact of people's reaction to a correction. However, there are indications that people trust their emotions when faced with information regarding a food risk and safety (Veflen et al. 2017; Olsen et al.), and emotion has been listed as a subject that should be further explored (Lewandowsky et al 2012). The present study therefore finds it interesting to investigate more emotional, system 1 appeals. Moreover, based on the existing literature and its effectiveness in correcting misinformation, the following hypothesis is proposed:

H1: Presenting correctional information will reduce the belief in the food safety misinformation.

2.2 Humor

2.2.1 Humor and corrective messaging

The effects of using humor in communication has been thoroughly documented throughout the body of existing literature, in different settings. It is also well used in marketing where it is reported that approximately 1 out of 5 ads are humoristic (Eisend 2009). According to meta-analysis of humor in advertising, Eisend (2009) concludes that humor increase positive attitude towards the advertisement and sender, while reducing negative cognitive processes. Moreover, humor is attention grabbing and can reduce the counter argumentation and message scrutiny (Nabi et al. 2007; Young et al.2018) which is beneficial in corrective messaging as this counter arguing often lead to reduced corrective effect and potential reinforcement of initial belief (Nyhan & Reifler, 2010). Given that people often are exposed to humor in settings that are perceived as less serious, it is believed that humorous content in a more serious context, (in this paper: food safety), can bypass the brains active or motivated reasoning (Moyer-Gusé, Robinson & Mcknight 2018; Nabi et al. 2007). Meaning that the brain will - based on the presence of humor - only activate system 1, and therefore

not process the message deeply, which this paper previously has stated can be good for corrective effect.

Similarly, when people are faced with fear messages they engage in activities that reduce the impact of the message, such as avoid looking at it, mentally reject the message (Mukherjee & Dubé 2012). In this regard, humorous messages have also been found to be more effective than non-humorous has the potential to lower the *fear tension arousal* that is present in messages that include elements of fear (Mukherjee & Dubé 2012) and reducing the defensive responses (Hendriks & Janssen, 2018). Humor can create a “safe space” for the recipients thoughts, instead of immediately activating defense mechanisms (Mukherjee & Dubé 2012). As corrective messages often can contain an element of fear, both in an objective (e.g. eating expired food can be dangerous) and subjective way (e.g. unpleasant cognitive dissonance), they could benefit from this humorous effect.

Furthermore, using humor in topics that are not particularly funny, such as vaccination (Moyer-Gusé et al 2018), might be extra useful since these topics can be perceived as boring, and thus humor can work as an attention grabber. However, messages containing humor do also have a higher risk of message discounting (Nabi et al. 2007), meaning that recipients judge the message to be no more than a joke because of its humorous tone, and therefore do not process the information as true, in the same way as more serious message. Additionally, humorous content can reduce potential backfire effects. When correcting misinformation regarding MMR vaccines. For those who already had the favorable beliefs, humor was less effective than a serious message, however it did not cause any backfire effects (Moyer-Gusé et al 2018).

A recent study by Young et al. (2018) looked at the use of humorous videos vs non-humorous videos and their effectiveness in correcting misinformation in a fact-checking format, in a political context. While they were unsuccessful finding significant differences, when correcting misinformation regarding the MRR vaccine, a recent study by Moyer- Gusé et al. (2018) found that humor messages were in fact

more effective in reducing hesitancy among parents to vaccinate their children against MMR vaccine, compared to a more serious message. The somewhat conflicting results can be indications that the context and theme of the misinformation, can alter the humorous effectiveness of the correction, as is the case with the correction itself (Walter & Murphy 2012). . Therefore, the current study aims to *explore* the role humor plays in a food safety context. Moreover, based on the above literature, and especially humors potential to bypass system 2 processes the study proposes the following hypothesis:

***H2:** A humorous message will be more effective at correcting misinformation than a non-humorous message.*

2.3 Celebrity and expert endorsement

The term “celebrity endorsement” is often referred to as “Any individual who enjoys public recognition and who uses this recognition on behalf of a consumer good by appearing with it in an advertisement” (McCracken 1989). The initial use of celebrity endorsement took place in a product advertisement context, and the use of celebrities in this context is still popular with approximately 1 in 4 advertisements including a celebrity to endorse their product or brand (Knoll and Matthes 2016). However, we now also see a more widespread usage of the concept where celebrity endorsers appear in messaging in settings such as NGOs and political messages, (Erdogan 1999; Knoll and Matthes 2016). Especially after the rise of social media, celebrities have increasingly gained more influence, as they now can use their own channels (e.g. instagram, youtube etc.) to promote what they desire (Choi and Berger 2009).

Celebrities are useful in communication because they easily capture people's attention (**Knoll and Matthes 2016**). Moreover, people are expected to be more aware and interested in messages with a celebrity, and thus be more motivated to further explore the ad to find out more about the product in question, especially if they like the celebrity (**Knoll and Matthes 2016**; Erfegen, Zenkert & Sattler 2015).

2.3.1 Mere-exposure and liking

Furthermore, celebrities are easy to like because we are familiar with them. The mere exposure effect, proposes that we like better what we have seen before, and the more we have seen it the more we like it (Zajonc 1968; Bornstein 1989). This effect applies for both object, brands and humans, indicating that a famous celebrity, which we have seen many times, will be liked better than a person we do not know. This means that solely because we have seen the person we'll like him or her more than someone we have not seen, even without taking into account other factors that could interfere such as liking their music, films, sporting behavior or similar. Furthermore, the strength of the connection between the celebrity and the consumer decides the effectiveness of the endorsement effects (McCracken 198; Knoll & Matthes 2016). Moreover, it has been demonstrated that mere-exposure effect is not reliant on active processing, but that it also works at a subliminal level (Moreland and Beach 1992). Meaning that even if we do not know that we have seen the person before, or have no recollection of it, we will still prefer the person or object over another making celebrity endorsers effective by that they in themselves are known, and therefore likely to be more liked.

In addition, when a liked and trusted celebrity promote a message that goes against the current belief of the receiver, the recipient can experience cognitive dissonance (Festinger 1957) , meaning two opposing opinions are held at the same time. In the search of resolving this dissonance, the person might accept the information from the celebrity, instead of disregarding their connection to the celebrity (Hoffman and Tan 2013; Festinger 1957).

Furthermore, it is expected that the personal qualities of celebrities are going to transfer to the message that's being communicated (McCracken 1989). Further, brands meaning are shown to change depending on the celebrity that endorses it (Miller & Allen 2012). Therefore the effectiveness and outcome of the communication depends on what qualities the celebrity has (McCracken 1989). Selecting the right celebrity for your desired meaning transfer is therefore necessary.

2.3.2 Celebrities and experts

When comparing different endorsers such as experts, regular persons and celebrities, it is the latter who has scored the best (Friedman and Friedman 1979; Arnocky et al 2018). However, little research has been done comparing corrective messages message sent by experts and celebrities. While there are indications that Expert (organizations) are more effective at correcting health misinformation on social media, than a normal person. (Bode and Vraga 2017 (1), it is also found that celebrities were more successful at increasing acceptance of evolutions than experts (Arnocky et al. 2018). Though an expert in a given field should naturally be more trusted and have more influence in their field, it seems as the liking and attachment we have to celebrities could make them better endorsers.

Moreover, as noted by Knoll & Matthes (2016), most of the current research on celebrity endorsement is done in a for-profit and advertisement context. The degree to which theory and results from such studies can be directly transferred to non-profit messages or corrective messages are unclear (Knoll & Matthes 2016). This paper therefore aims at checking whether the celebrities beneficial endorsement effects seen in current research holds also for corrective messages, in a non-profit context. Thus, it the following hypothesis is presented:

H3: A celebrity endorser will be more effective at correcting misinformation than an expert endorser.

Moreover, given that the reasoning behind H2 (humor) and H3 (celebrity) are quite similar and in similar direction. This paper proposes that a corrective message including both a humorous tone and celebrity endorser will have greater potential to correct misinformation.

H4: A corrective message containing both a humorous tone and a celebrity endorser will be most effective at reducing the belief in the myth.

3.0 Current study

While other paper have examined different relationships and effects of correcting misinformation, none to the authors best knowledge has looked at the effectiveness of correcting myths in a food safety context. As different context provide different effects in terms of message effectiveness, it is in itself interesting to see how people respond to corrective messages. Moreover, the frequent use of celebrities and humor in advertising and for-profit warrants an investigation of their respective effectiveness in corrective messaging. Comparing the humorous tone with endorser type in the given context, has currently not been done.

Furthermore, the current body of literature use corrections that are quite long (e.g. Moyer-Gusé et al (2018) used a text with 875 words; Young et al. 2017 used 59 sec. video). However, keeping the correction short and simple has been recommended, in order to avoid the overkill backfire effect (Lewandowsky et al. 2012). Moreover, social media has been proven a good platform for correcting messages, given the ease of targeting and sharing, as well as the existence of social norms that prohibits system 2 thinking (Bode and Vraga 2015). In addition, humorous content is more likely to shareable (Berger & Milkman 2012). Suggesting that texts or formats that are more social media friendly should be investigated. According to Facebook expert Jeff Bullas, the ideal Facebook post has 40 characters and Twitter between 71 and 100 characters. (Jeffbullas.com, Socialreport.com 2019). Therefore this paper will use a shorter text containing 60 words in the humorous condition and 71 words in the non-humorous condition.

4.0 Study 1: Pre study - stimuli selection

4.1 Method

Prior to the main study a short pre-study was conducted to test and select the different stimuli for the main study. The goal was to find the most suitable celebrity and expert, and to assure that corrective texts in fact differed in terms of humor. The study was conducted using an online survey created in Qualtrics. A within-subjects design was used as having a between-subjects design would require a substantially higher number of respondents. Several one way repeated measures ANOVA were run to compare the means measures of the different stimuli.

The myth chosen to be tested was selected based on data from an ongoing study by Safeconsume in Norway, UK and Germany (Veflen 2019) and is presented below:

Myth: *“If the food smells and tastes fine it is safe to eat”*

4.2 Participants and procedure

A total of 17 participants were acquired via a convenience sample through Facebook messenger. It was ideal to keep the number of participants low, as Facebook would be used to collect participants for study 2. Given that participants could not participate in both studies, and that would reduce possible participants in study 2. The participants were asked to rate different statements using a 7-point Likert Scale, ranging from “Completely disagree” to “completely agree”. This was done for three different texts, four pictures of celebrities and four experts, and five institution. Two bloggers were also rated with regards to a potential third study, however this was not made, excluding these from further analysis.

4.3 Stimuli

4.3.1 Correctional text

The text used to correct the myth was collected from www.safefood.com, and confirmed to be valid by researchers in the Safeconsume project. An is presented bellow:

“Although a bad smell or taste are signs that food has ‘gone off’, these signs often aren’t caused by germs that give you food poisoning. So the food’s appearance, smell or taste aren’t reliable warning signs. Instead, stick to the ‘use by’ date and storage instructions on the packet”.

The text was adapted and translated to Norwegian (Appendix A) The decision was made to have both survey and all text in Norwegian for several reasons. First, it is a study that looks at myth based on belief in Norway, and is thus interested in Norwegian respondents. Secondly, to better suit the respondents the stimuli needed to be adapted to Norwegian (e.g. using Norwegian celebrities). Third, allowing the respondents to answer in their native language reduces the risk of misunderstandings and following wrong answers, and is thus a mean increase reliability (Kahneman 2013).

In line with the recommendations of Lewandowsky et al. (2012) the correction has an alternate story to reduce the Continued influence effect (*other bacteria creates the dangerous...*), it does not repeat the myth to avoid Familiarity Backfire Effect and it is short to avoid overkill backfire effect.

4.3.2 Humorous version

The humorous text was created to be as similar to the non-humorous text as possible, with regards to the internal validity of the study. A short sentence was added in the beginning of the text for humorous effect:

In the same way when you look for a boyfriend/girlfriend, looks, smell or taste will not be reliable signals.....

Norwegian: På samme måte som når man velger seg en kjæreste, vil utseende, lukt eller smak ikke være pålitelige signaler....

4.3.2 Celebrity Stimuli

Given that gender can impact several endorser effects, and there are indications that male are to some degree more effective (Knoll & Matthes 2016; Arnocky et al. 2018), only male celebrities and experts were included. According to Knoll and Matthes (2016) the most effective endorser types are (in order) actors, athletes, tv hosts,

models and musicians. Therefore, celebrities in the highest performing categories were selected and tested. The celebrities in used were actor Aksel Hennie, Ex-downhill skier Aksel Lund Svindal, TV host Jon Almaas and Celebrity stylist Jan Thomas. (Appendix C)

4.3.3 Expert stimuli

Four different images of stereotypical experts/researchers looking people were presented included. (Appendix C). Respondents were asked to rate them on similar questions as the celebrities.

4.4 Results

4.4.1 Humor

Based on the (Moyer-Gusé et. al. 2018) the respondents indicated on a 7 point Likert from “Completely disagree” to “Completely agree” that the text was humorous. Results indicate that there was a significant difference in perceived humor between the non-humorous text, ($M = 2.12$, $SD = 1.536$) and the humorous ($M = 4.00$, $SD = 1.732$), $F(2,32) = 14.386$, $p < .001$, partial eta squared = .473. A third text (2) was initially included, which scored the highest ($M = 4.65$, $SD = 1.869$), however this text was excluded as it lacked corrective information and was found to different from the non-humorous text.

4.4.2. Celebrity results

According to meta-analysis by Amos, Holmes and Strutto (2008), we can rate the most important attributes of celebrity’s effectiveness to be trustworthiness, expertise, physical attractiveness, credibility, familiarity and likeability. (Amos, Holmes and Strutto 2008; Knoll). Celebrity no. 3, Aksel L. Svindal, scored highest in credibility ($M = 5.53$, $SD = 1.12$), expertise ($M = 5.41$, $SD = 1.07$ liking ($M = 6.12$, $SD = 0.99$), famousness ($M = 6.65$, $SD = 1.06$) and second highest in trustworthiness ($M = 4.71$, $SD = 1.40$) $p < 0.1$. He was therefore chosen for the main study.

4.4.3 Expert results

Expert number 1 scored highest on expertise ($M = 5.59$, $SD = 1.06$), trustworthiness ($M = 4.59$, $SD = 1.12$), second highest in credibility ($M = 4.59$, $SD = 1.12$) $p < .001$. Non-significant differences in responses on famousness nevertheless showed that the scientist had the lowest mean here ($M = 2.18$, $SD = 1.59$) $p = 0.616$. Following these results, expert number 1 was selected to the main study.

4.4.4 Organizations

Moreover, institutions were also tested and compared. **Matprat** (a Norwegian website with food recipes etc. created by the Information Office of egg and meat (Opplysningskontoret for egg og kjøtt, The Norwegian Food Safety Authority (*Mattilsynet*), Blogg.no (website for hosting personal blogs, used by the most famous Norwegian bloggers) and to TV channels NRK and TV Norge The Norwegian Food Safety Authority scored highest on credibility ($M = 6.00$, $SD = 1.32$), expertise ($M = 6.12$, $SD = 1.26$) and trustworthiness ($M = 5.76$), all values $p < .001$

5.0 Study 2 - Humor, celebrities and correcting misinformation

Based on the results from the testing done in study 1, the appropriate text, celebrity, expert and institution, were selected and paired.

5.1 Method

A quantitative method using an experimental design was chosen to best test the hypotheses. *This assures more internal validation, however at an expense of the external.* As the intention was to test if there are differences in correctional effectiveness between the humor and celebrity stimuli, a between-subjects design was suitable. However, since it is also of interest to find if the corrective message is effective over to instances it also holds a within-subjects design, where the grouping

variable is the condition. Using this designs, participants will only be exposed to one condition, while measuring the internal change in each condition using repeated measures ANOVA. Allowing the respondents to see multiple conditions and thereby also several corrections would potentially cause order effects that would impact the measure of corrective effect(Charness, Gneezy & Kuhn 2012).

5.1.1 Stimuli

Based on the results from the pre study, an image of the selected celebrity and expert was presented besides the two different correctional texts, humoristic and non humoristic. The celebrity's name (Aksel Lund Svindal) and a title (Ex alpine skier) was added below the text. Similarly, Following the example of Arnocky et al. (2018), the expert was given a fake name (Frank J. Knudsen) and a job title as Senior Researcher at the The Norwegian Food Safety Authority, at the department of Hygiene and Food infection (matsmitte), which was also added bellow.

5.1.2 Procedure

The survey was created and responses were collected using the survey software Qualtrics. Respondents were given some basic information regarding the survey such as assurance of their anonymity, procedure and that the topic was related communication of food safety. However, there were no mentions of either misinformation, humor or endorser type in the text to avoid revealing the studies complete and true intent. Participants were then asked to rate their agreement to the food safety myth: *“If the food smells and tastes fine it is safe to eat”* on a 7 point Likert scale, with values from “Completely disagree” to “Completely agree”. A neutral middle value 4 (“Neither/nor”) was in place in order to not force responses. Thereafter they were asked to thoroughly read the next page (as it contained the correction), and the participants were following randomly assigned into one of the four different conditions (Figure 1)

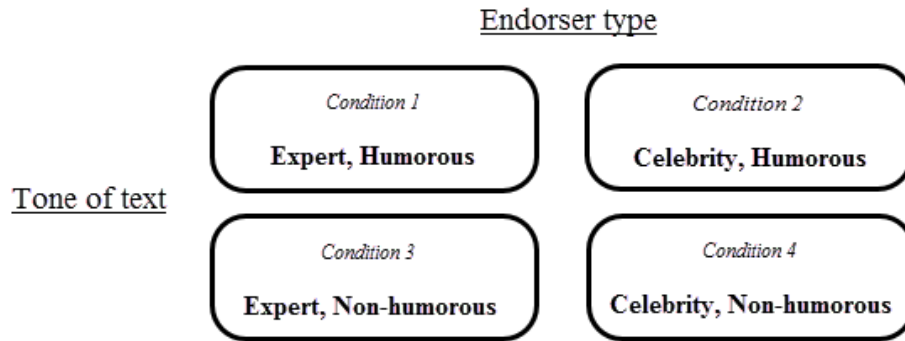


Figure 1: The four conditions

After reading the corrective text, participants were again presented with the myth and asked to rate their agreement, using the same scale as previously. Thereafter they answered other questions their knowledge and interest in food safety, their current and future trust in their senses, message discounting and lastly their age and gender. These variables were excluded from further analysis as they were deemed relevant for the current hypotheses. The last page contained a debriefing informing the participants that the correction in fact was true, and that none of the endorsers present were involved. Please see Appendix B for the complete survey (*in Norwegian*).

5.1.3 Respondents

The respondents were collected through a convenience sample and snowball sample using Facebook. The survey was constructed so that each of the conditions should receive the same amount of respondents. However, due to removal of incomplete responses ($n = 37$) they were somewhat skewed, but all above. After removal of incomplete responses the total number of respondents was $n = 157$, consisting of 62.5% ($n = 59$) females and 37.6% ($n = 98$) male and an average age of 36 ($M = 36.21$, $SD = 14.95$). Due to the sampling method a wide age range is observed.

Measure	Item	Frequency	Percentage
Gender	Female	98	62.4%
	Male	59	37.6%
	Total	157	100 %
Condition	Expert, Humorous	40	25.5%
	Celebrity, Humorous	38	24.2%
	Expert, Non-humorous	35	22.3%
	Celebrity, Non-humorous	44	28 %
	Total	157	100 %
Age	19-24	17	10.8%
	25-29	73	46.5%
	30-39	17	10.8%
	40-49	14	8.9%
	50-59	14	8.9%
	60-69	19	12.1%
	70+	2	1.3%
	Missing	1	0.64%
	Total	157	100 %

Table 1: Gender, age and condition group size

5.1.3 Analysis

The data collected through Qualtrics was exported and analyzed in the statistical software SPSS. In order to perform the analyses, some of the variables were recorded. Two dummy variables were created, one for the humorous (1) and non-humorous (2) text, and one for the expert image (1) and celebrity image (2). Lastly a third new variable called “Condition” was created, where the respondents were given a value of either 1 2 3 or 4 according to their respective condition, where 1 = *Expert Humorous*, 2 = *Celebrity Humorous*, 3 = *Expert non-humorous* and 4 = *Celebrity non Humorous* (Figure 1)

5.2 Results

5.2.1 H1: Corrective message

The first test was conducted to test hypothesis 1, and see if the correction had an effect overall, not taking into account humor or celebrity variables. Results from the One-way-mixed repeated measures ANOVA showed significant differences in the belief in myth, before and after exposure to the correction. $F(1, 156) = 32.275, p < .001$, Partial Eta squared: .171, indicating a large effect. The belief in the myth was significantly higher before the correction ($M = 5.59, SD = 1.368$) than after ($M = 5.10, SD = 1.537$). Indicating that the correcting the corrective information significantly reduced the belief in the misinformation, regardless of the different conditions.

5.2.2 H2: Humorous vs non- humorous

In order to see if humor (regardless of celebrity or expert) had an overall effect on the change in belief in myth, the same repeated measures analysis was run but including the grouping variable humor as a between subjects effect. Although there was a difference in total mean between the humorous ($M = 5.244, SE = 0.153$) and non-humorous condition ($M = 5.462, SE = 0.152$), this effect is not significant, $F(1, 155) = 1.023, p = .313$. Looking at the within-effects we see that the two groups vary in initial belief, and that the non-humorous condition had a higher reduced belief (figure X), although this effect is also not significant $F(1, 155) = 1.981, p = .161$. Hypothesis 2 must therefore be rejected, as a humorous correction does not reduce beliefs more. Rather there are indications of the reverse.

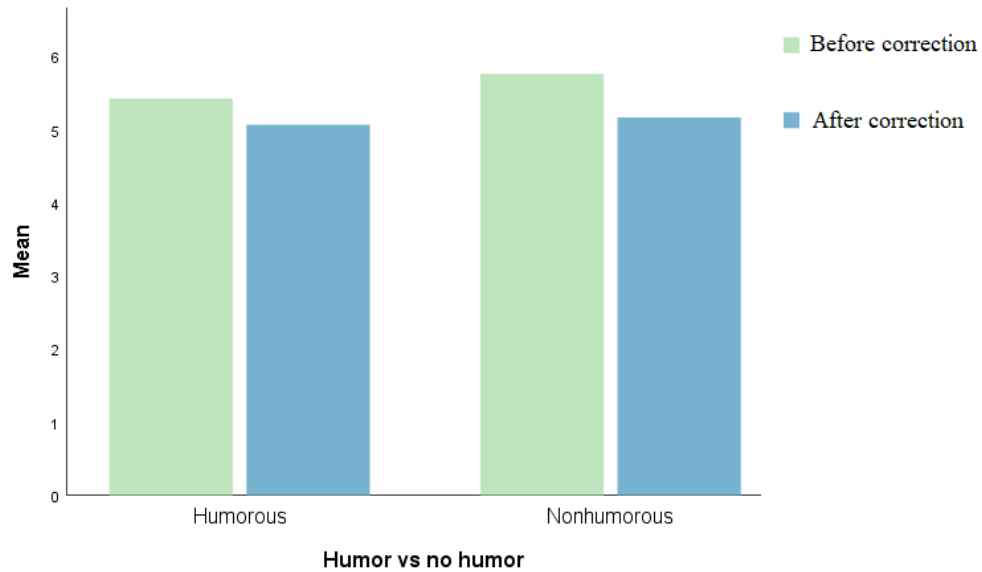


Figure 2: Humor vs no humor coditons

5.2.3 H3 Expert vs celebrity

Repeated measures ANOVA with the grouping variable expert ($n = 75$) vs celebrity ($n = 82$), without accounting for humor conditions. Similar with the humor results, tests show that that there was a difference in overall mean between expert condition ($M = 5.200$) and celebrity condition ($M = 5.494$), though it was not significant, $F(1,155) = 1.858$, $p = .175$. Moreover, it was evident that the expert conditions beliefs were reduces more, final mean was lower for the expert condition ($M = 4.893$, $SE = 0.176$), than the celebrity condition ($M = 5.317$, $SE = 0.168$), however not significant $F(1, 155) = 2.401$, $p = .123$. Indicating that also hypothesis 3 must be rejected

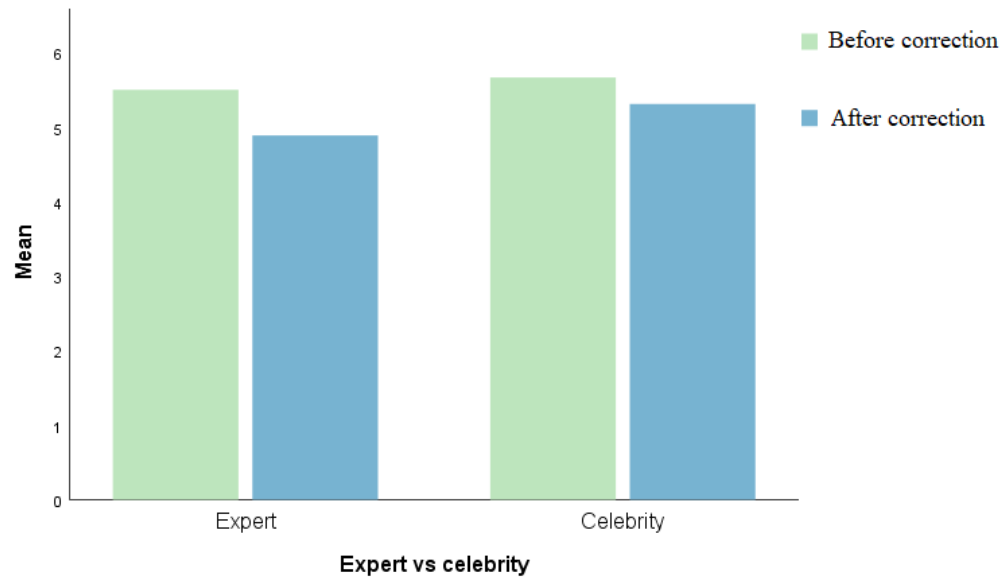


Figure 3: Expert vs Celebrity condition

5.2.4 H4 - Four Conditions

To test the hypothesis 4 and in order to see if the four different conditions has a different impact on the change in belief. Levene's test of equality of error variances is not violated for the two time measures as both have non-significant values, $p > .075$, indicating equal group variances. Moreover, test of between-subjects effects reveal that the main effect of the conditions on change in belief are not significant $F(3, 153) = .896, p = .445$, Partial Eta Squared = .017.

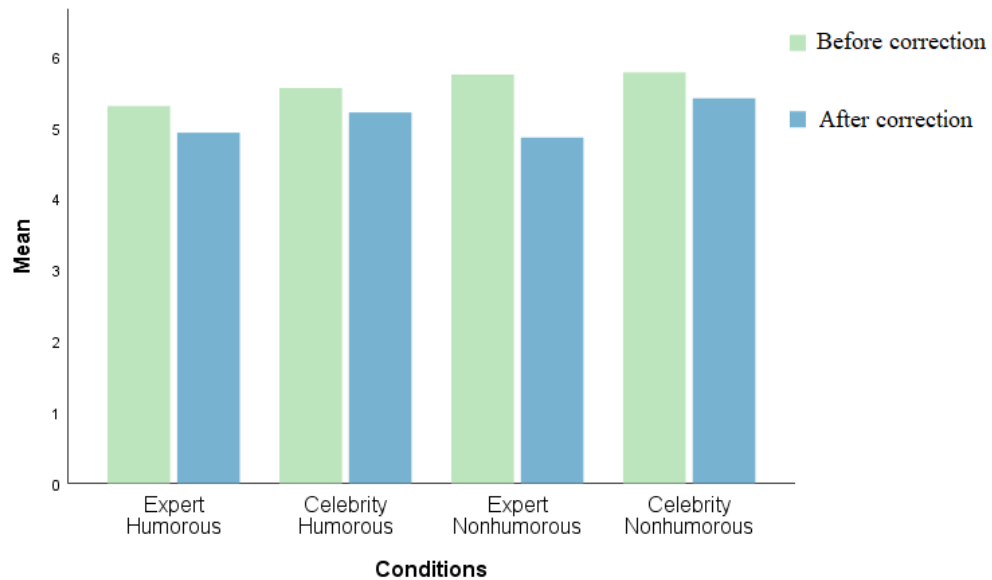


Figure 4: The four conditions

The overall difference in mean between the conditions in belief in myth are therefore quite similar. However, when the results from within subjects interaction effect, one finds that there are is an interaction effect between the conditions and the change in belief, that is marginally not significant at a 95% level $F(3,153) = 2.315$, $p = 0.078$, partial Eta square = 0.043. Hypothesis 4 is thus rejected. Moreover, there are indications of opposite effects as the expert non-humorous condition has the biggest reduction in mean. This can be seen in figure x. Although not a significant difference it is a result that warrants some further comments. Figure 5 illustrates clearer the non significant interaction effect

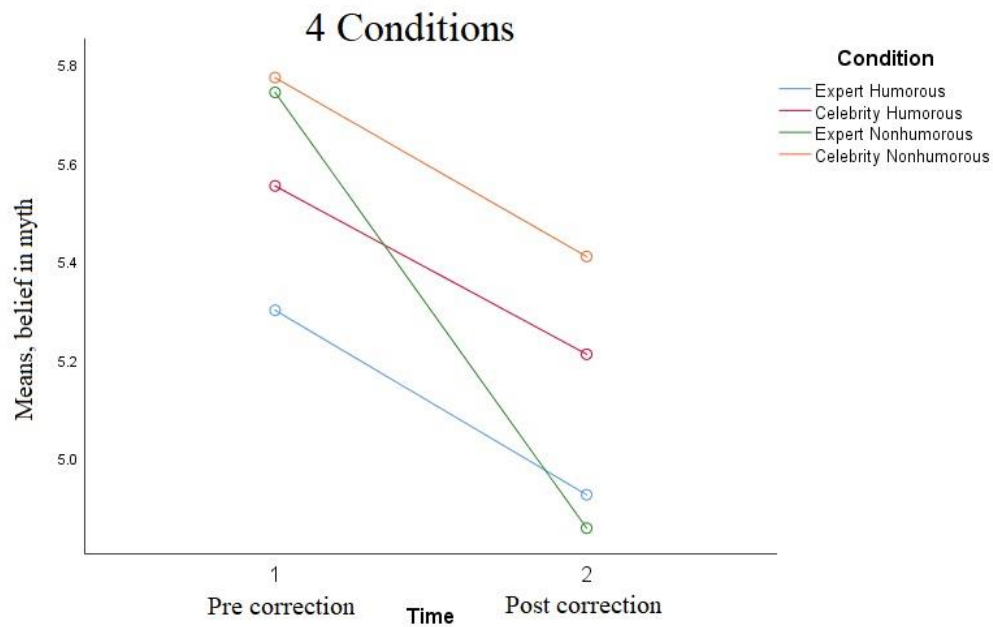


Figure 5: 4 conditions, interaction.

6.0 Discussion

To the best of the author’s knowledge this is the first paper that examines the effect of corrective information in a food safety context. The different context do impact the level of difficulty that the correction face. Therefore, there is value in the results presented from the analysis above, that the current study show that corrective messages are to a degree successful at reducing misinformation regarding food safety. Moreover, as expected, the correction is not able to completely eradicate the falsely held belief that sensory perceptions can determine the safety of food. Thus, it is evident that also this study demonstrates the presence of the well established Continued Influence Effect (e.g Lewandowski e 2012) effect, also in a food safety context. However, it must be noted that while a the correction worked, the respondents still indicate a total mean value of $M = 5.10$, which in regards to the scale would mean a value of “Somewhat agree”. Therefore, while perhaps useful

information in a research perspective, one should keep in mind that the generalizability should not be overestimated.

Nevertheless, in contrast to what was proposed, the study was not able to find evidence that humor can enhance the reduction of misinformation. Why this is the case is hard to say given that there are few other studies in this topic, so that it cannot be certain whether this is in fact due to the topic (food safety) or a consequence of weaknesses in the humor stimuli or measurement. A reason could be that the humorous text, although significantly higher than the non-humorous, is not rated as very funny. The mean value ($M = 4.00$, $SD = 1.732$) indicating a more neutral value. However, the difference in perceived humor are quite similar to other studies comparing the humorous messages and non-humorous messages:

- $M = 5.31$ vs $M = 4.02$ (Moyer-Gusé et al 2018),
- $M = 2.63$ vs $M = 2.12$ (Young et. al 2017),
- $M = 4.38$ vs $M = 3.07$ (Hendriks & Janssen 2018)

Moreover, it must also be noted that in this study, a high degree of humor was sacrificed for internal validity. Testing out different levels of humor and message types could provide different results. It must also be mentioned that humor in experiments is often not rated highly, however perform better in real life, and also print format is less effective than video (Eisend 2009). One of humors strong arguments - the ability to grab attention, is an important element which the present study design was not able to include. In a setting where it is necessary to compete for attention, this is an element that could be interesting to observe.

While not significant, there are tendencies in the data that the most successful way of correcting misinformation regarding food safety is by using an expert endorser and non-humorous text (Figure 5). This is interesting, as in is in complete contrast to what was expected. While the data in this study does not allow confident recommendations regarding the different groups. This effect points to a tendency that is worth exploring more, to find out whether it is an effect related to this topic or a weakness of the study. Elements such as message fit and celebrity congruence and

should be considered to be further explored. It would also be interesting to see if it corrections works differently for those with high or low knowledge in food safety.

Moreover, we have all experienced that humor is individual. Also pointed out by Moyer-Gusé et al. (2018), one should be careful with simplifying the concept of humor, as humor takes on many forms (satirical, dry, slapstick etc.) which could very well have different effects, for different people, in different context. Further exploring if different humor types matter would therefore be of interest.

The study has some obvious weaknesses that should be taken into account when evaluating the results. The convenience sample is not suitable to generalize the findings and the measurements of constructs are simple and can be subject to low reliability. Moreover, covariates should be explored such as gender, age, education etc. as they can have an impact of the successfulness of the correction.

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8.0 Appendices

Appendix A – Different conditions with text.

BI NORWEGIAN
BUSINESS SCHOOL



“Utseende, lukt eller smak er ikke pålitelige signaler på om maten er trygg å spise.

Selv om dårlig utseende, lukt eller smak er signaler på at maten har blitt dårlig, er ofte disse signalene laget av andre bakterier enn de som gir deg matforgiftning.

Istedenfor bør du forholde deg til “spis innen” eller “siste forbruksdag”-merkingen og følge oppbevarings-instruksene på pakken.”

Aksel Lund Svindal
Tidligere alpinist

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“På samme måte som når man velger seg en kjæreste, vil utseende, lukt eller smak ikke være pålitelige signaler på om maten er trygg å spise.

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Frank J. Knudsen
Seniorforsker, Hygiene og Matssmitte
Mattilsynet



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Seniorforsker, Hygiene og Matssmitte
Mattilsynet

Appendix B - Survey

Fulfileringsgrad av spørreundersøkelsen
0% 100%

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Tusen takk for at du velger å gjennomføre min undersøkelse!

Dette er en undersøkelse i forbindelse med min mastergrad ved Handelshøyskolen BI. Hensikten med studien er å få bedre innsikt i hvordan man bør kommunisere aspekter knyttet til mattrygghet.

Vær vennlig og svar så ærlig som mulig gjennom hele undersøkelsen. Det vil ta ca **2 minutter** å gjennomføre.

Din besvarelse vil være helt anonym og all data som samles inn vil bli behandlet konfidensielt, uten at dine svar kan spores til deg. Det vil kun rapporteres resultatet av samlede data og aldri individuelle svar.

Deltagelsen i denne studien er frivillig, og du kan når som helst trekke deg eller nekte å delta.

Ved å gå videre godtar du det ovennevnte og velger av fri vilje å delta i studien.

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I hvilken grad er du enig i påstanden under:

Hvis maten lukter og smaker bra er det trygt å spise den.

Helt uenig Uenig Nokså uenig Verken eller Nokså enig Enig Helt enig



Vennligst les teksten på neste side nøye før du går videre.

Forstått



"Utseende, lukt eller smak er ikke pålitelige signaler på om maten er trygg å spise.

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Frank J. Knudsen
Seniorforsker, Hygiene og Matmatte
Mattilynet

→

(Expert, no humor)

I hvilken grad er du enig i påstanden under:

Hvis maten lukter og smaker bra er det trygt å spise den.

Helt uenig Uenig Nokså uenig Verken eller Nokså enig Enig Helt enig

Jeg kjenner til personen på forrige side

Ja

Nei

→

BI NORWEGIAN BUSINESS SCHOOL

Jeg interesserer meg for mattrygghet

Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig

Jeg kan mye om mattrygghet

Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig

Mattrygghet er viktig for meg

Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig

[→](#)

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Jeg stoler på mine egne sanser når jeg vurderer mattrygghet

Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig

Jeg kommer til å stole mindre på mine egne sanser neste gang jeg vurderer hvor trygg en matvare er


Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig

Jeg tror informasjonen jeg fikk i teksten er korrekt

Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig

Det er lett å tro at teksten kun var en spøk

Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig


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Budskapet i teksten passet med avsenderen

Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig

Tonen i teksten passet til avsenderen

Helt uenig Uenig Litt uenig Verken eller Litt enig Enig Helt enig

 NORWEGIAN BUSINESS SCHOOL

Alder (skriv inn alderen din):

Kjønn

Mann

Kvinne

Annet

Ønsker ikke svare

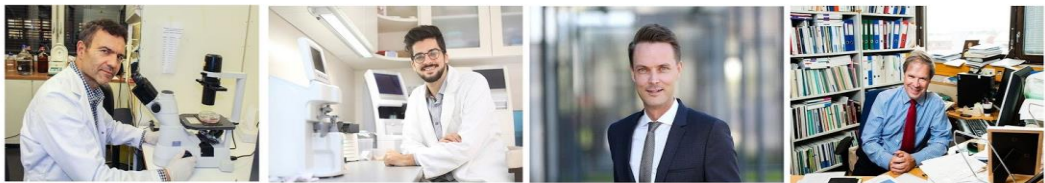
**Tusen takk for din deltagelse!**

Informasjonen du fikk opplyst i teksten er korrekt.

Det er en vanlig oppfatning at man kan se, lukte og smake for å finne ut av om maten er trygg å spise. Dette er derimot ikke riktig. Som du fikk opplyst, er disse signalene ofte laget av andre bakterier enn de som gir deg matforgiftning. Maten kan dermed både se, lukte og smake fint, men være utrygg å spise. Forskjellige typer matvarer vil naturligvis utgjøre forskjellige grad av fare, men det vil uansett anbefales at man følger datomerking og er nøye med å oppbevare maten korrekt for å unngå at maten skal bli utrygg.

Personen du så i denne undersøkelsen har ikke uttalt det som står i teksten og det er ingen sammenheng mellom personen og teksten, ei heller selskapet han jobber for.

Dersom du har spørsmål vedrørende undersøkelsen kan du ta kontakt med meg på eivind.hoel@student.bi.no

Appendix C – Experts and celebrities*Expert 1, 2, 3 and 4**Celebrity 1, 2, 3 and 4*

