

# Should Manufacturers Use Food Labels? The Case of Chocolate

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# Should Manufacturers Use Food Labels?

## The Case of Chocolate

### Abstract

Food labels, such as organic labels or fair-trade labels, have proliferated in recent years. Although consumers know such food labels, they often do not know the underlying criteria. Prior research has shown that showing food labels on the packaging increases willingness-to-pay. But it has not investigated whether communicating the underlying criteria would be even better. We use chocolate as an example and show, based on an experiment and a Conjoint Analysis conducted in Switzerland (n=293) that willingness-to-pay is significantly lower for a chocolate that shows food labels than for a chocolate that shows the underlying criteria. We identify “no forced or child labor” and “no pesticides” as the most important underlying criteria. Willingness-to-pay for “no forced or child labor” can be as high as 2.25 CHF. Furthermore, we show that manufacturers can mainly attract two segments with that practice that make up 65 percent of the market.

*Keywords: Food Labels; Conjoint Analysis; Willingness-to-Pay*

*Track: Social Responsibility & Ethics*

## 1. Introduction

Sustainable food with organic or fair-trade labels have proliferated in recent years. For consumers, food labels have an information function and can influence the purchasing decision. They are, in addition to brand and price, decision criteria.

However, the multitude of food labels is confusing. Although many consumers are aware of the negative environmental effect of their consumption, it can quickly become a challenge for consumers to find their way around the “jungle” of labels (Buerke, 2017). Also, there are more and more reports about, for example, dioxins in food or listeria in fish, which unsettle consumers and influence the purchasing decision (Probst and Gomez, 1991, Loos, Bertels, and Müller, 2013; Sander, Heim, and Kohnle, 2016).

According to Sander et al. (2016), consumers want more information about products, are aware of sustainability issues, or question the manufacturing process. Nevertheless, many consumers are not familiar with the content and the underlying criteria of food labels (Van Amstel and Driessen, 2008; Grunert, Hieke and Wills, 2014; Roussau, 2015). Even though there are guidebooks and online platforms like, for example, [www.labelinfo.ch](http://www.labelinfo.ch) in Switzerland or [www.label-online.de](http://www.label-online.de) in Germany, it is time-consuming to deal with food labels. And, in a purchasing decision, consumers are faced with a trade-off between brand, price, food labels, and other decision criteria (Grunert et al., 2014).

Nevertheless, prior studies show that willingness-to-pay is higher for products with food labels because consumers trust these products more (Bienenfeld, 2014). Dedier and Lucie (2008), however, show for chocolate that consumers prefer a chocolate with an organic label more than a chocolate with an organic label and a fair-trade label. Therefore, two food labels are not necessarily better and there seem to be different preferences for the underlying criteria of food labels. This is also supported by Howard and Allen (2010). They identify different preferences for five underlying criteria of food labels: humane, local, living wage, small-scale, and U.S. grown. However, they do not measure the impact on willingness-to-pay.

Our main research objective is to investigate the impact of food labels and their underlying criteria on purchase intention and willingness-to-pay. We use chocolate as an example. In the next section, we give an overview of existing food labels for chocolate and describe prior research.

## 2. Food Labels for Chocolate

Chocolate is an important product in Switzerland. At the same time, however, the chocolate industry is often criticized for its lack of transparency in cocoa production (Fountain and Huetz-Adams, 2018). In Switzerland, consumers buy more and more chocolate with fair-trade labels. In 2017, sales of chocolate with fair-trade labels increased by 71 percent. Nevertheless, the market share of chocolate with fair-trade labels is just 6 percent (Max Havelaar-Stiftung, 2018). Therefore, consumers seem to show an attitude-behavior gap (Vecchio and Annunziata, 2015; Vermeir and Verbeke, 2008).

According to Public Eye (2018), the most important food labels for cocoa and chocolate, respectively, are “Fairtrade Max Havelaar”, “EU-Bio”, “UTZ Certified”, and “Rainforest Alliance”. They are shown in Table 1.





Food labels	Logo
Fairtrade Max Havelaar	
EU-Bio	
UTZ Certified	
Rainforest Alliance	

Table 1. Food labels for chocolate

The “Fairtrade Max Havelaar” label considers ecological, fair-trade, and social criteria, whereas the “EU-Bio” label mainly focuses on ecological criteria. “UTZ-Certified” and “Rainforest Alliance” merged in 2018 with the intent to make use of synergies.

Considering that many consumers do not know the underlying criteria of food labels, the question arises whether it is useful to show food labels at all (Vlaeminck and Vranken, 2015), or whether it is useful to show the underlying criteria of food labels.

Therefore, we ask the following research questions:

1. What is the impact of showing food labels versus showing the underlying criteria of food labels on purchase intentions?
2. What is the impact of showing food labels versus showing the underlying criteria of food labels on willingness-to-pay?

3. What is the importance of the underlying criteria of food labels?

### 3. Methodology

To answer our research questions, we conducted an online survey. In the first part, we measured demographic variables and shopping preferences. In the second part, we presented two different chocolate bars in a within-subjects design (see Figure 1). One showed the “Fairtrade Max Havelaar” and the “EU-Bio” label, and one showed the underlying criteria of these labels. For both chocolate bars, we measured purchase intention (on a scale from one to ten) and willingness-to-pay (in CHF). We did not show the chocolate bars simultaneously but randomized the order.

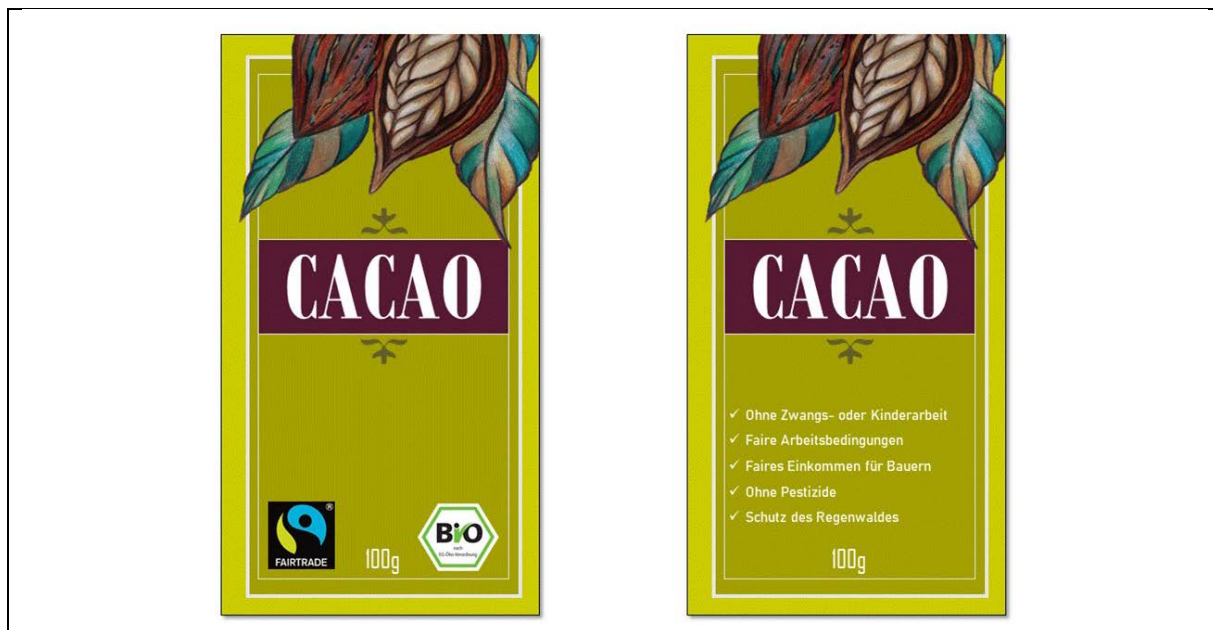


Figure 1. Chocolate bars for the experimental design

In the third part, we conducted a Conjoint Analysis. We used a Choice-Based Conjoint Analysis (CBC), which includes a choice task and is appropriate when the price of a product is part of the choice task (Orme, 2014). It is the most commonly used type of Conjoint Analysis (Orme, 2014). Table 2 shows the design with eight attributes in total. Five attributes represent the underlying criteria of the “Fairtrade Max Havelaar” and the “EU-Bio” label. The levels for the price are in line with the price for different chocolate brands in Switzerland in supermarkets and other retail stores.

Attributes and labels	Relative importance	Utilities
<i>Brand</i>	15.77	-
<ul style="list-style-type: none"> <li>• Lindt</li> <li>• Frey</li> <li>• Cailler</li> <li>• Milka</li> <li>• Store brand</li> </ul>		66.54 23.13 0.33 -30.39 -59.61
<i>Cocoa</i>	3.77	
<ul style="list-style-type: none"> <li>• 30%</li> <li>• 50%</li> <li>• 70%</li> </ul>		15.05 0.04 -15.08
<i>No forced or child labor</i>	18.13	
<ul style="list-style-type: none"> <li>• Guaranteed</li> <li>• Not guaranteed</li> </ul>		72.53 -72.53
<i>Fair labor conditions</i>	6.64	
<ul style="list-style-type: none"> <li>• Guaranteed</li> <li>• Not guaranteed</li> </ul>		26.55 -26.55
<i>Fair wages</i>	8.42	
<ul style="list-style-type: none"> <li>• Guaranteed</li> <li>• Not guaranteed</li> </ul>		33.67 -33.67
<i>No Pesticides</i>	18.16	
<ul style="list-style-type: none"> <li>• Guaranteed</li> <li>• Not guaranteed but controlled</li> <li>• Not guaranteed</li> </ul>		66.54 12.18 -78.72
<i>No tropical deforestation</i>	12.34	
<ul style="list-style-type: none"> <li>• Guaranteed</li> <li>• Not guaranteed</li> </ul>		49.39 -49.39
<i>Price</i>	16.77	
<ul style="list-style-type: none"> <li>• 1.90 CHF</li> <li>• 2.90 CHF</li> <li>• 3.90 CHF</li> <li>• 4.90 CHF</li> <li>• 5.90 CHF</li> <li>• 6.90 CHF</li> </ul>		60.46 36.79 18.22 -8.61 -33.17 -73.70

Table 2. Conjoint design and results

In total, we conducted 12 choice tasks with 3 choices. We also included a none-option, which is important to calculate willingness-to-pay (Miller, Hofstetter, Krohmer, and Zhang, 2011).

We approached staff and students of a Swiss university. The response rate was 8.9 percent. Overall, our sample consists of 293 respondents, thereof 39% males and 51% females. The average age of the respondents is 35 years.

#### 4. Results

Our results show, based on a t-test for paired samples, that purchase intention ( $M=5.54$ ) for the chocolate bar with the “Fairtrade Max Havelaar” and “EU-Bio” label is significantly lower than purchase intention ( $M=6.06$ ) for the chocolate bar with the underlying criteria of these labels ( $T=4.827$ ;  $df=292$ ;  $p=0.000$ ). Likewise, willingness-to-pay ( $M=3.56$  CHF) for the chocolate bar with the “Fairtrade Max Havelaar” and “EU-Bio” label is significantly lower than willingness-to-pay ( $M=3.91$  CHF) for the chocolate bar with the underlying criteria of these labels ( $T=5.379$ ;  $df=287$ ;  $p=0.000$ ).

This is surprising since 81% of all respondents said they know the “EG Bio” label well or know what it is about, and since 94% of all respondents said they know the “Fairtrade” label well or know what it is about. The results indicate that manufactures should rather show the underlying criteria of these labels.

To further investigate which criteria are important, we calculated the relative importance of each attribute shown in the CBC. No forced or child labor ( $M=18.13$ ) as well as no pesticides ( $M=18.16$ ) are the most important underlying criteria of these labels. And they are even more important than price ( $M=16.77$ ) and brand ( $M=15.77$ ).

Therefore, manufacturers should focus on no forced or child labor and no pesticides since these criteria influence choice most. But how much could they charge? We calculated willingness-to-pay for the following chocolate bar:

- Store brand
- 30% cocoa
- No forced or child labor guaranteed
- Fair labor conditions guaranteed
- Fair wages guaranteed
- No pesticides guaranteed
- No tropical deforestation guaranteed.

In line with Miller et al. (2011), we considered the utility of the “no choice” option for each respondent and calculated the utility of the chocolate bar shown above. If this utility was above the utility of the “no choice” option, we gradually increased the price until we reached the utility of the “no choice” option. This resulted in an average willingness-to-pay of 4.66 CHF.

This willingness-to-pay is significantly higher than the willingness-to-pay derived from the open-ended question ( $t=4.190$ ;  $df=289$ ;  $p=0.000$ ). However, this is in line with prior studies that compared a measurement of willingness-to-pay with a CBC and an open-ended question (e.g., Miller et al., 2011; Ding, Grewal and Liechty, 2005).

We also calculated willingness-to-pay for individual criteria by comparing willingness-to-pay for the chocolate bar above with willingness-to-pay for the same chocolate bar but with “no forced or child labor *not* guaranteed”. In that case, average willingness-to-pay is 2.41 CHF. This indicates that the potential surcharge for “no forced or child labor” can be as high as 2.25 CHF.

To consider segment-specific differences, we conducted a cluster analysis based on the relative importance of each attribute. Based on the elbow method, we chose a solution with 4 segments. Results are shown in Table 3.

Segment 1 (24 percent) is most focused on the brand. Segment 2 (41 percent), the largest segment, is most focused on “no forced or child labor”, “no pesticides” and “no tropical deforestation”. It is least focused on the price. Segment 3 (24 percent) is most focused on “no forced or child labor”, “fair labor condition” and “fair wages”. Segment 4 (11 percent) is most focused on the price. Therefore, the most attractive segment for manufacturers planning to communicate the underlying criteria of labels is segment 2.

There is no significant difference between the segments in terms of gender ( $X^2=12.546$ ;  $df=6$ ;  $p=0.051$ ) and in terms of age groups ( $X^2=17.937$ ;  $df=15$ ;  $p=0.266$ ). Therefore, the difference between the segments is not based on demographic criteria but rather on psychographic criteria. There is a significant difference between the segments in terms of how much they look for calories ( $F=4.588$ ;  $df=3$ ;  $p=0.004$ ), taste ( $F=8.721$ ;  $df=3$ ;  $p=0.000$ ) and natural ingredients ( $F=7.427$ ;  $df=3$ ;  $p=0.000$ ).

Attributes and labels	Relative importance	F value
Brand	15.77	
<ul style="list-style-type: none"> <li>• Cluster 1</li> <li>• Cluster 2</li> <li>• Cluster 3</li> <li>• Cluster 4</li> </ul>	31.54 9.64 10.49 16.62	107.787 (p=0.000)
Cocoa	3.77	
<ul style="list-style-type: none"> <li>• Cluster 1</li> <li>• Cluster 2</li> <li>• Cluster 3</li> <li>• Cluster 4</li> </ul>	3.62 2.56 2.93 10.49	16.187 (p=0.000)
No forced or child labor	18.13	
<ul style="list-style-type: none"> <li>• Cluster 1</li> </ul>	13.42	37.547



• Cluster 2	20.78	(p=0.000)
• Cluster 3	23.62	
• Cluster 4	6.12	
Fair labor conditions	6.64	
• Cluster 1	6.11	3.496 (p=0.016)
• Cluster 2	6.94	
• Cluster 3	7.84	
• Cluster 4	3.97	
Fair wages	8.42	
• Cluster 1	9.04	5.967 (p=0.001)
• Cluster 2	7.87	
• Cluster 3	10.39	
• Cluster 4	4.77	
No Pesticides	18.16	
• Cluster 1	13.39	79.761 (p=0.000)
• Cluster 2	26.97	
• Cluster 3	11.52	
• Cluster 4	9.86	
No tropical deforestation	12.34	
• Cluster 1	10.44	11.801 (p=0.000)
• Cluster 2	15.18	
• Cluster 3	11.89	
• Cluster 4	6.75	
Price	16.77	
• Cluster 1	12.45	124.222 (p=0.000)
• Cluster 2	10.05	
• Cluster 3	21.31	
• Cluster 4	41.43	

Table 3. Segment-specific differences

## 5. Implications and Limitations

Our study shows that manufacturers of chocolate should not show food labels but rather their underlying criteria. By doing so, they can reach higher purchase intentions, and they can reach a higher willingness-to-pay. Especially “no pesticides” and “no forced or child labor” are important criteria.

Our study has some limitations. First, in our conjoint design we used 5 attributes for the underlying criteria of labels. This leads to an overestimation of the importance of these criteria. Second, we used “guaranteed” and “not guaranteed” as levels. While manufactures would communicate “guaranteed” on the packaging, they would not communicate “not guaranteed” on the packaging. Future research should rather use “shown” and “not shown” as levels. Third, our sample consists of university staff and students. Therefore, the education

level in our sample is quite high. Future research should conduct a similar study with a sample, which is representative for the overall population.

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