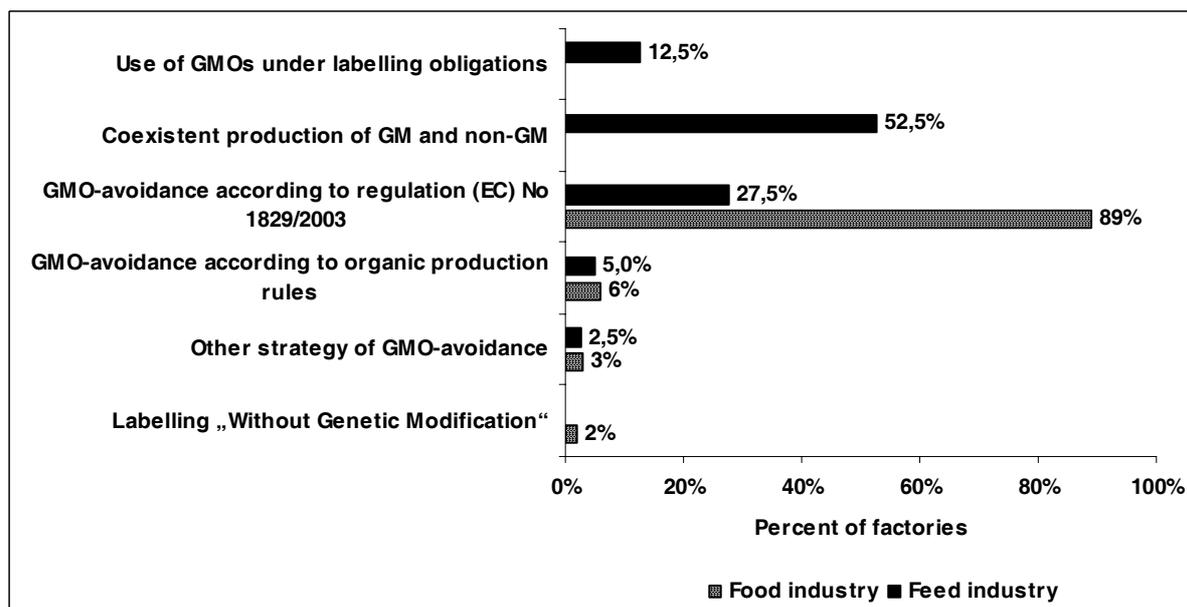


## Implementation of the EU-Legislation of Genetically Modified Organisms in the German Food and Feed Industry with specific emphasis on GMO-testing

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The worldwide acreage of genetically modified (GM) plants is growing year by year and amounted to 90 million hectares in 2005 (CLIVE 2005). In contrast to the growing use of GM plants in agriculture, the acceptance of GM food is still low in the European Union (EU) as well as in Germany (FRANK, 2004). Therefore the European Union implemented a series of legal requirements and regulations which are related to R&D, commercial use and labelling of genetically modified organisms (GMO). The food and feed industry is mainly affected from Regulations (EC) No 1829/2003 and 1830/2003. Thus this study analyses the effects of those regulations on the German food and feed industry with special emphasis on GMO-testing regimes. The empirical basis was a comprehensive written survey in 2005 with a total of 1,700 mailed questionnaires. The responding rate was about 20%, thus resulting in 333 filled in questionnaires. The main target of regulations (EC) No 1829/2003 and 1830/2003 is to ensure consumers' freedom of choice between GM and non-GM food. Therefore those regulations require mandatory labelling if food and feed contains, consists or is produced from GMOs in a proportion higher than 0.9% of the food/feed ingredients considered individually. According to our survey the German food and feed industry is already affected by the worldwide increasing use of GMOs and the European GMO legislation. In figure 1 the main strategies of the German food and feed industry are illustrated to fulfil legal requirements of Regulations (EC) No 1829/2003 and 1830/2003.

**Figure 1: Strategies of German food and feed producers to fulfil legal requirements of Regulation (EC) No 1829/2003 and 1830/2003**



SOURCE: OWN INVESTIGATION

If the food and feed industry is willing to avoid GMO labelling they have to face higher production costs in order to keep adventitious GM presence under the 0.9% threshold. Main cost drivers of GMO free production are additional personnel costs, higher costs of raw materials and costs for GMO analytics. In feed industry additional costs of GMO free raw materials can reach 1.4% of the turnover, additional personnel costs can amount to 0.3% of the turnover and additional costs of GMO analytics can rise up to 0.6% of the turnover. In the food industry a factory of margarine and special fats obtained the highest additional costs of GMO free raw materials with about 0.4% of the turnover. A factory of confectionary products obtained the highest additional personnel costs of around 0.2% of the turnover and a factory of soy products

indicated they had the highest costs as a result of GMO analytics of around 0.1% of its turnover. In this context it is important to mention that raw materials and food ingredients derived from soybean (e. g. soy oil, flour, lecithin), corn (e. g. flour, starch, starch derived-sugars, isoglucose) and rapeseed (e. g. oil, flour) are main sources of unintended GMO admixture (since around 60% of the worldwide soy, 14% of the worldwide corn and 18% of the worldwide rapeseed production was GM in 2005 (TRANSGEN 2005B)). Aside contractual agreements about the GMO-free status of raw materials, analytical GMO testing is an important measure to identify GMOs in food and raw materials. An overview about GMO testing regimes is given in table 1 thereby considering costs and number of tests per year. In this context it is necessary to mention that GMO analytics is mostly forwarded to and carried out in specialised labs.

**Table 1: Costs of GMO testing regimes in different branches of the German food and feed industry**

	Feed	Milling	Confec-tionary	Bakery	Dairy	Friut/ Vegetable	Meat
<b>Quantitative<sup>1)</sup></b>	17	61	44	6	28	12	29
<b>Costs<sup>2)</sup></b>	176 €	179 €	155 €	207 €	169 €	219 €	170 €
<b>Qualitative<sup>3)</sup></b>	80		13		26		33
<b>Costs<sup>4)</sup></b>	145 €		163 €		157 €		130 €
<b>Costs/year<sup>5)</sup></b>	14,592 €	10,919 €	8,939 €	1,224 €	8,814 €	2,628 €	9,220
<b>Costs in % of the turnover<sup>6)</sup></b>	0,15%	0,02%	0,01%	0,01%	0.002%	0.01%	0.005%
1) Number of quantitative GMO tests per year 2) Costs of one quantitative GMO test 3) Number of qualitative GMO tests per year 4) Costs of one qualitative GMO test 5) Costs of GMO testing per year 6) Costs of GMO testing per year in relation to the average companies turnover							

SOURCE: OWN INVESTIGATION

Measures and costs of implementing Regulations (EC) No 1829/2003 and 1830/2003 in the German food and feed production industry depend on branches and raw material base of the industry. Additional cost of GMO free raw materials lead mainly in the feed, and in some branches of the food industry to significantly higher costs - in particular in such branches in which soybeans, corn and rapeseed are used as the main ingredients. So far it seems that applied measures, especially GMO testing, were sufficient to avoid GMOs in the German food and feed production. According to the results of governmental control agencies in Bavaria and Baden-Württemberg labelling requirements of Regulations (EC) No 1829/2003 and 1830/2003 were properly fulfilled in 2004 as there were only a few cases where GMO admixture was detected in food products, and if so this was mostly in compliance with legal thresholds; without incurring labelling obligations (TRANSGEN 2005A).

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