

# Vulnerability Analysis

## FOOD INDUSTRY



### How Vulnerable is the Food Industry in the Metropolitan Region Bremen-Oldenburg?

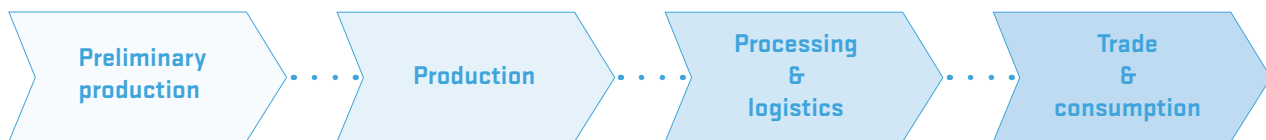


The vulnerability analysis of the food industry in the Metropolitan Region Bremen-Oldenburg is based on an examination of the supply chains of the poultry, pork, dairy and fish industries.

A look at the supply chains makes it possible to also take those climate impacts into consideration that do not involve the region directly, but rather are introduced into the region via the international flows of materials and goods, and which then affect the region as a result of economic activity. In view of the increasing international interconnection of the food industry, this examination can reveal important adaptation requirements, beyond simply adaptation to the regional effects of climate change. The supply chains are broken down into four stages.

The results compiled here are based on a research concept which includes both a comprehensive review of the literature for all supply chains examined, and also the involvement of practice partners in the poultry, pork, and fish industries, and expert workshops for the poultry, pork, and dairy industries.

Detailed analyses of the fish, dairy and pork and poultry industries are available under [www.nordwest2050.de](http://www.nordwest2050.de) (in German).



- (1) Preliminary production:** Production of feed, of pesticides and fertilizers, of farm and other machinery and facilities, and of packaging
- (2) Production:** Agriculture, fisheries (primary production)

- (3) Processing and logistics:** Processing of agricultural and fisheries products and food, conservation, preparation and packaging (food industry and food-related trades)
- (4) Trade and consumption:** Wholesale and retail.

#### Overview of the results of the vulnerability study of the food industry in the Metropolitan Region Bremen-Oldenburg:

Supply chain, dairy industry	Potential impacts	Adaptive capacity	Vulnerability
Preliminary production	medium (positive)	medium-high	Low
Production	low-medium (negative)	low	Medium
Processing	low (negative)	medium	Low
Trade & consumption	low (negative)	medium-high	Low

■ low   ■ medium   ■ high vulnerability



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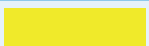

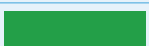
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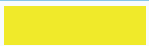


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Supply chain, fishindustry	Potential impacts	Adaptive capacity	Vulnerability
Preliminary production, fishery products	medium (positive & negative)	medium	
Preliminary production, aquacultureproducts	medium (somewhat negative)	medium	
Processing	medium (negative)	medium	
Created consumption	low (somewhat negative)	medium-high	



Supply chain, poultry industry	Potential impacts	Adaptive capacity	Vulnerability
Preliminary production	medium (somewhat negative)	low-medium	
Production	medium-high (somewhat negative)	medium-high	
Processing	low (negative)	medium-high	
Created consumption	gering (negativ)	medium-high	



Supply chain, pork industry	Potential impacts	Adaptive capacity	Vulnerability
Preliminary production	medium (somewhat negative)	low-medium	
Production	medium (negative)	low-medium	
Processing	low (negative)	medium-high	
Created consumption	low (negative)	medium-high	



**What common results were ascertained for the various supply chains?**

The supply chains of the fish, poultry and pork industries are somewhat more vulnerable at the level of preliminary production than is that of the dairy industry. All supply chains show one common feature, however, which is their exposure to the growing danger of delays or interruptions of deliveries, including those resulting from extreme weather events, and of cost increases, particularly due to higher requirements for cooling in hotter summers, a potential impact of climate change. At the same time, reduced numbers of sub-freezing days could provide opportunities for the regional food industry, since

there would be lower heating costs, and the logistics would be less subject to unfavourable transport conditions.

The downstream stages, such as Processing and Trade, will only be affected by climate change to a slight degree, for all industries examined. However, this activity is the determining factor for the supply chain, and can, like changed political conditions, have a significant effect on the situation. For the pork and poultry and especially the fishindustries, a change in the availability of resources will have to be assumed, for it has become apparent that the impacts of climate change will be very complex, and may affect actors in the supply chain via socio-economic and other impacts of the second or third degree.