



Building the case for innovative animal feeds

How KPMG True Value helped

January 2020



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The results of this analysis could change perceptions within the livestock production industry. They could trigger meaningful dialogue across the value chain and help to shift farming towards more sustainable practices.

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Dr. Emmanuel Auer

Head of Animal Nutrition,
Evonik Nutrition & Care GmbH





How KPMG True Value helped

Innovative animal feed can reduce environmental and social impacts

As the world's population grows, so does demand for meat, fish, milk and eggs. However, livestock farming also contributes to some of the world's most serious challenges, including climate change, land degradation, and pollution. More sustainable methods of livestock farming are therefore urgently needed and altering the composition of animal feeds is one potential solution.

Conventional animal feed is high in protein which leads to high levels of nitrogen in animal waste. The nitrogen in animal waste can cause environmental problems including the acidification of soil and overgrowth of algae in waterways (eutrophication). It can also cause potentially harmful air pollution from ammonia which can lead to the formation of particulate matter.

Evonik Animal Nutrition has developed amino acids as additives for animal feed that help to reduce the animals' protein intake. This, in turn, decreases the level of nitrogen in their waste. The innovative animal feed also improves the efficiency of the animals' digestion, reducing both the amount of food and water they consume and the amount of waste they produce.

To build the case for using innovative animal feed on a large scale, Evonik worked with finance and sustainability professionals at KPMG member firms to measure and value the economic, social and environmental impacts of livestock production. The analysis, using the KPMG True Value methodology, compared the impacts of using innovative animal feed with the impacts of using conventional feed.

About Evonik Industries AG

Evonik is one of the world's leading specialty chemicals companies.

It operates
in over



100

countries

Employs
more than



32,000

people

And generated
sales of over



€13bn

in 2018

Evonik's Animal Nutrition division is a leading global provider of feed additives for modern animal nutrition.

The approach

How Evonik and KPMG valued the societal impacts of livestock production

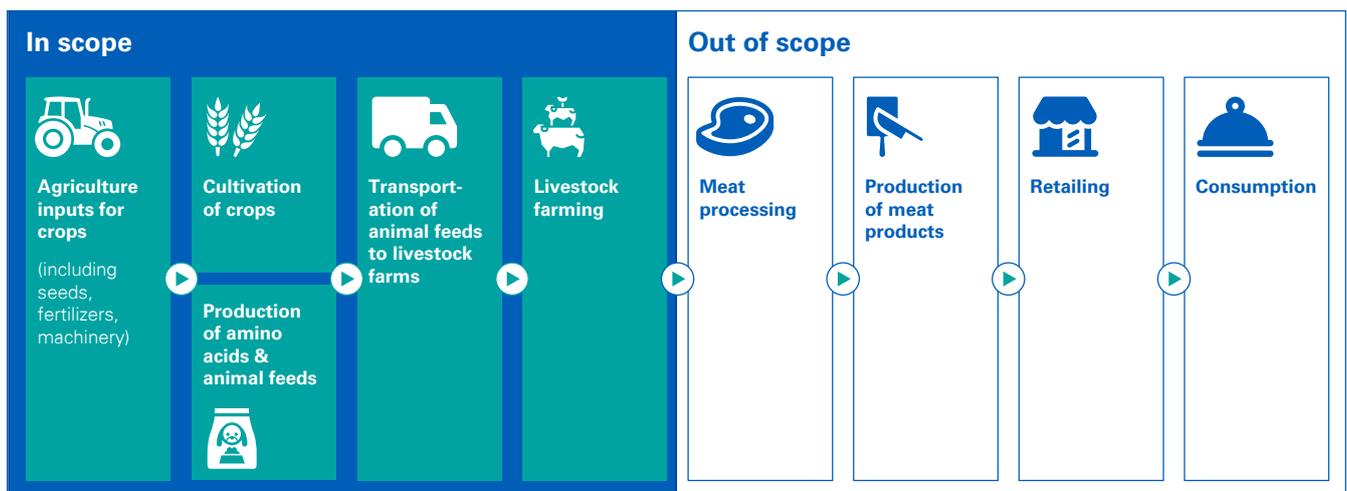
Scope of the analysis

The Evonik/KPMG True Value analysis covered the economic, environmental and social impacts of meat production across the value chain from the cultivation of crops for animal feed through to animal husbandry. The analysis stopped at the farm gate and did not include the downstream social and environmental impacts of meat processing, retailing and consumption because these are largely outside Evonik's sphere of influence.

The analysis was based on 2018 market shares of innovative feed in chicken production in Brazil and pork production in China, and on the most advanced innovative feed composition available at the time.



Figure 1: Applied scope of the analysis



How the impacts were selected and valued

The first step was to conduct research to identify the most significant economic, social and environmental impacts of chicken production in Brazil and pig production in China (See Figure 2). The team then quantified these impacts in financial terms using valuation data selected from a wide variety of sources including the US Environmental Protection Agency (EPA), the Organization for Economic Co-operation and Development (OECD) and The Economics of Ecosystems and Biodiversity (TEEB).

The Evonik/KPMG True Value analysis expressed each impact as a financial value per live weight ton of chicken or pork produced. For example, the health impacts of air pollution from chicken production in Brazil were valued at €322 per live weight ton of chicken produced.

Once a financial value had been established for each impact, the total value of impacts¹ could be calculated for production using innovative animal feed and production using conventional feed. Comparing the two calculations revealed significant differences between the two types of animal feed in terms of their social and environmental impacts and the value they create or reduce for society.

¹ Referred to in the analysis as 'societal value'

Figure 2: Economic, social and environmental impacts included in the analysis

| | |
|---|--|
|  <p>Economic impacts</p> | |
| Direct and indirect Gross Domestic Product (GDP) contribution | Economic value added by livestock production and its supply chain, including taxes paid and jobs maintained or created |
| Induced economic impacts | Economic activity generated by consumer spending by workers in the livestock production industry and its supply chain |
| Subsidies | Government subsidies received by the livestock production industry and its supply chain |
|  <p>Social impacts</p> | |
| Air pollution | Health impacts on farm workers and local communities of airborne particulate matter from animal waste |
|  <p>Environmental impacts</p> | |
| Soil acidification | Soil acidification primarily caused by ammonia emissions from animal waste |
| Eutrophication | Nitrogen pollution of waterways and overgrowth of algae caused by animal waste |
| Greenhouse gases (GHGs) | Emissions of GHGs throughout the livestock production value chain |
| Land use | Loss of natural habitats through conversion to agriculture |
| Water consumption | Use of water to grow crops for animal feed and water consumed by livestock |



The results

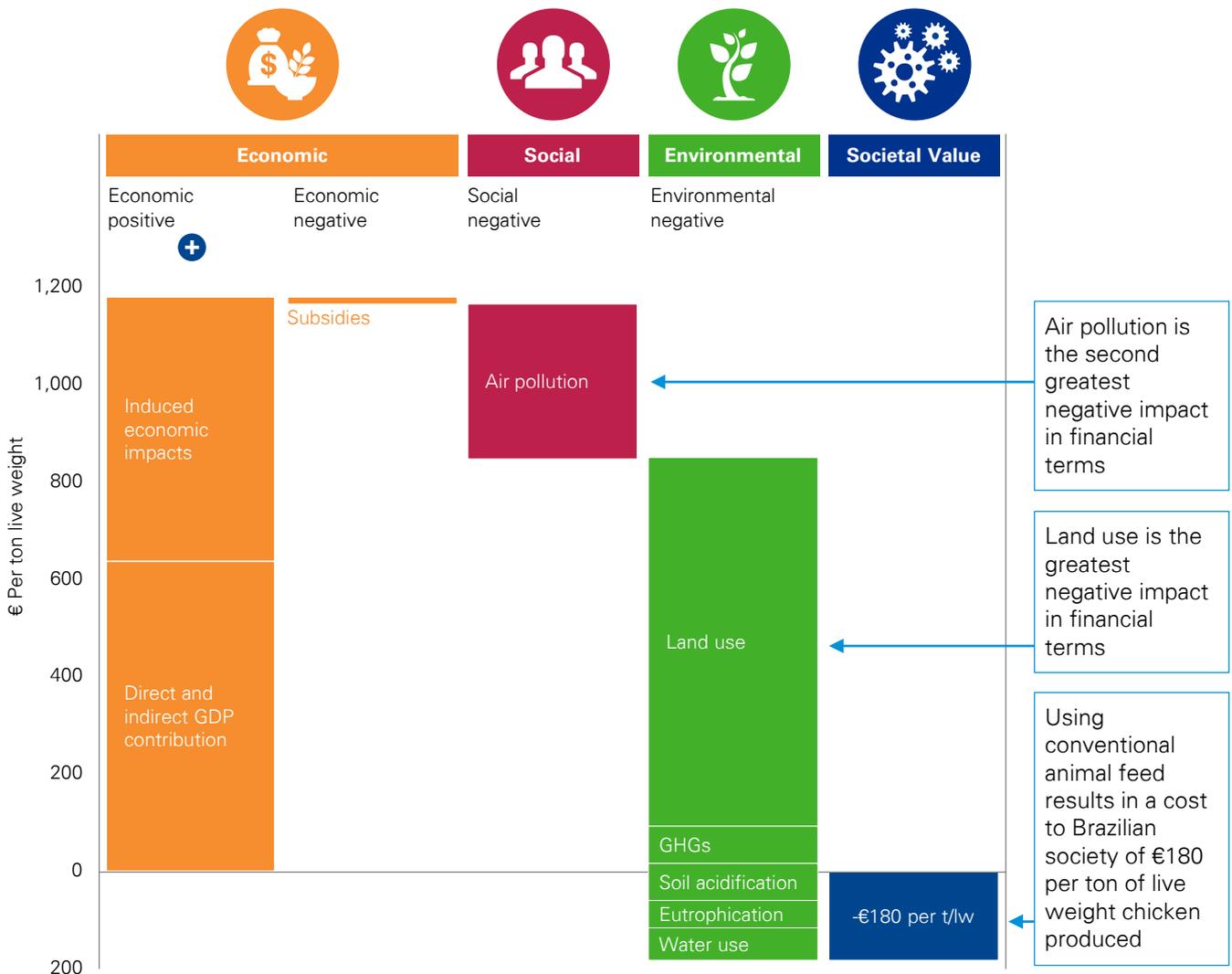
Understanding the true value of chicken production in Brazil

Using innovative animal feed creates societal value by reducing the environmental and social impacts of chicken production

The analysis valued the environmental and social impacts of chicken production in Brazil at €1,345 per ton of live weight (t/lw) when conventional animal feed is used. The most significant impacts are land use for the production of crops for animal feed and air pollution from the chickens' waste.

When conventional animal feed is used, chicken production incurs a net cost of €180 per t/lw on Brazilian society (see Figure 3).

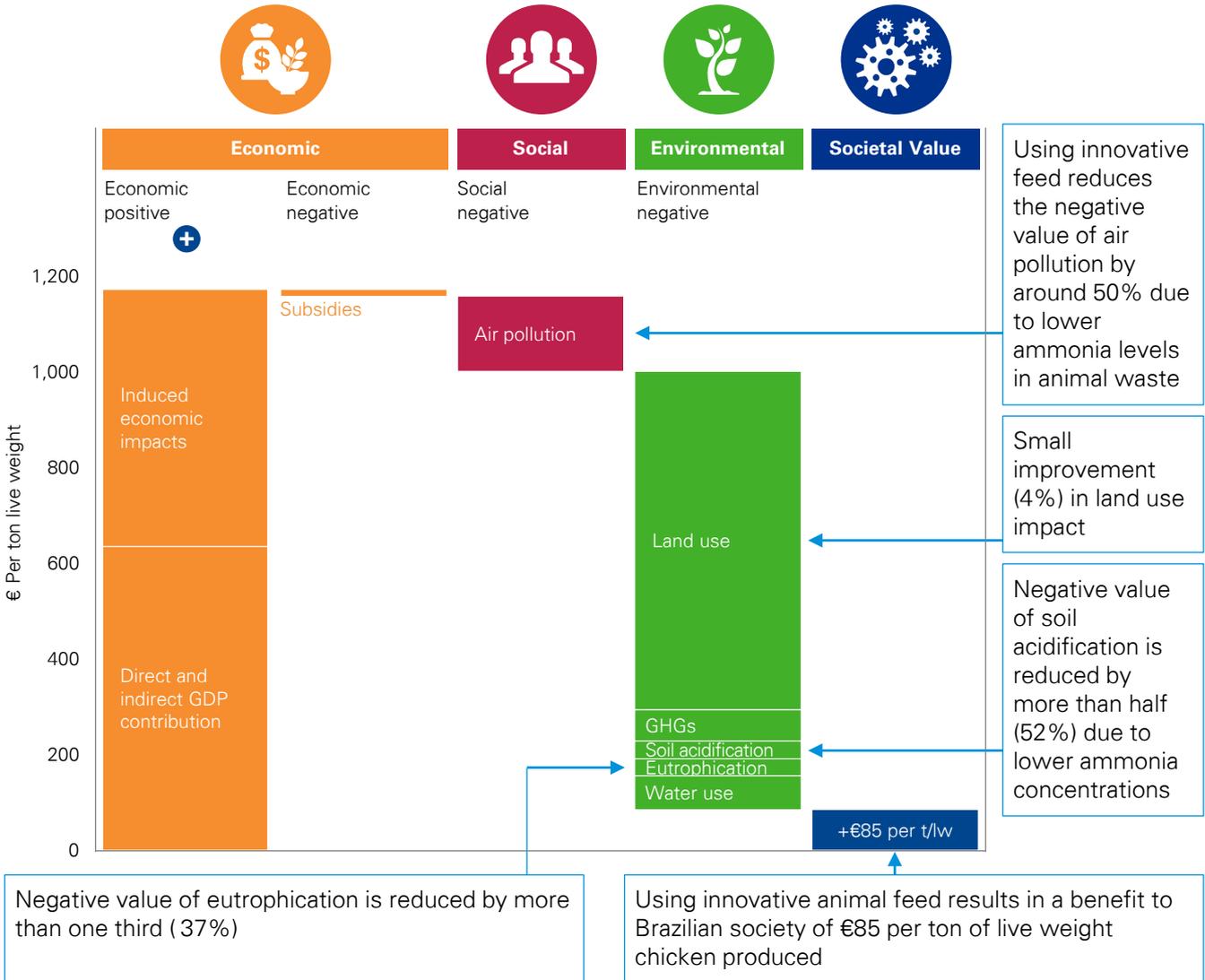
Figure 3: True value of chicken production in Brazil using conventional animal feed



However, when innovative animal feed is used, the negative environmental and social impacts of chicken production are reduced by one third. The biggest reductions are in air pollution and the potential for soil acidification and pollution of waterways.

If innovative animal feed were used instead of conventional feed, the industry would create a net benefit of €85 per t/lw for Brazilian society. (See Figure 4)

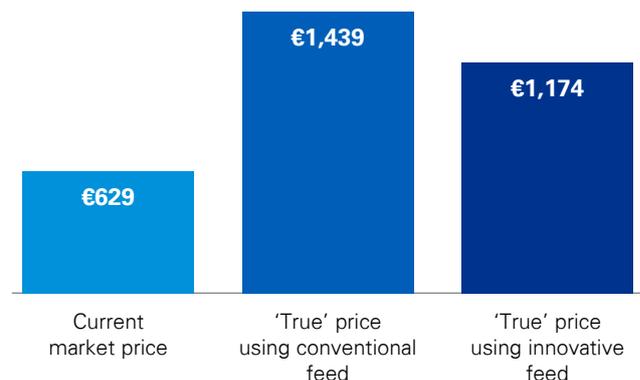
Figure 4: True value of chicken production in Brazil using innovative animal feed



Using innovative animal feed would reduce the 'true' price of chicken in Brazil

The 'true' price of a product is the market price plus the hidden costs and benefits to society of producing that product. By putting a financial value on the economic, social and environmental impacts of chicken production, the hidden costs and benefits to society can be quantified and the 'true' price can be calculated. The KPMG True Value analysis showed that the current market price of chicken in Brazil is less than half the 'true' price. Using innovative animal feeds would reduce the 'true' price by 18 percent.

Figure 5: 'True' prices of chicken in Brazil

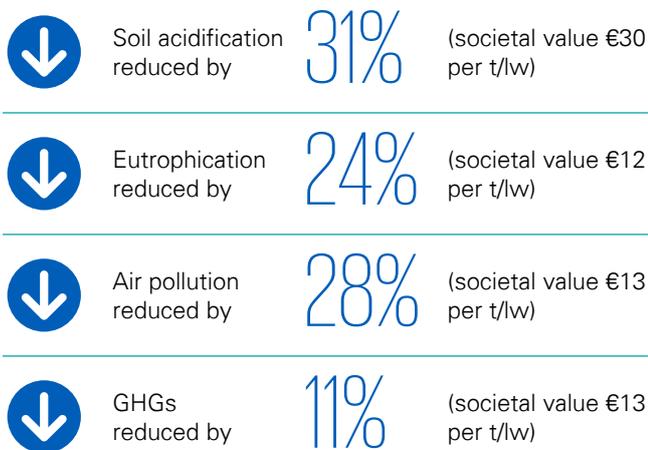


The results

Innovative animal feed could reduce environmental and social impacts in China

The KPMG True Value analysis of pig farming in China showed similar results. Using innovative feed instead of conventional feed for pigs could have significant effects on the industry's social and environmental impacts (see Figure 6).

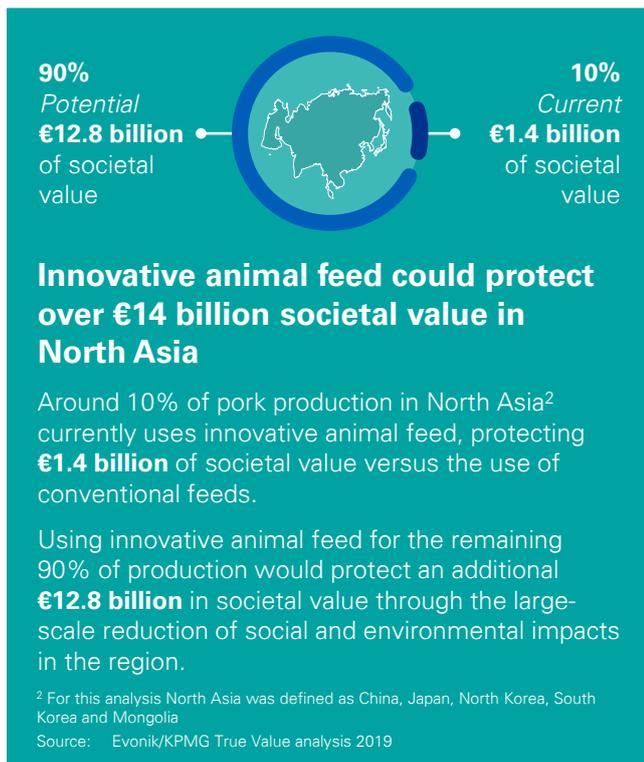
Figure 6: Impact reductions of using innovative animal feed in pig farming in China



Source: Evonik/KPMG True Value analysis 2019



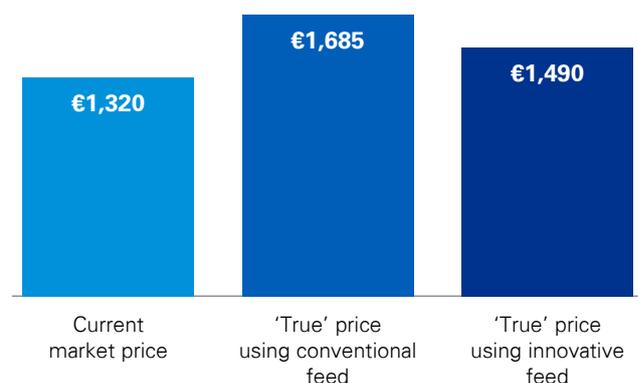
Using innovative animal feed would increase the societal value of pig farming in China by 20% (€195 per t/lw)



Using innovative animal feed would reduce the 'true' price of pork in China

By putting a financial value on the economic, social and environmental impacts of pork production, the hidden costs and benefits to Chinese society can be quantified and the 'true' price of pork can be calculated. The KPMG True Value analysis showed that using innovative animal feed could reduce the 'true' price of pork by almost 12% (see Figure 7).

Figure 7: 'True' prices of pork in China



What next?

How is Evonik using the KPMG True Value analysis?

Evonik is sharing the results of this study widely with its suppliers and customers, regulators, policy makers, academics and others to help drive positive and sustainable change in the livestock industry on a global scale.

The company's goal is to generate engagement and debate around how the livestock industry can work together to address its social and environmental challenges.

The analysis helped to identify and improve understanding of the negative social and environmental impacts of livestock production. It has identified many opportunities to substantially reduce these negative impacts by using innovative animal feeds.

Evonik therefore sees this analysis as a tool to guide its decision-making in innovation and product portfolio management to develop new products that have an even greater positive effect on society.

With the livestock industry under increasing scrutiny for its environmental and social impacts, Evonik believes that changing the composition of animal feed can help farmers to engage in fact-based discussions about the societal value they create. This could help to strengthen farmers' social license to operate in the future.

Evonik therefore plans to expand the scope of its research to measure the impacts of its feed in other major livestock producing regions in the world. The company also plans to measure the societal impacts of feed in the dairy and aquaculture sectors.



This casestudy was written
by KPMG in Germany.

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