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Food or non-food: Which agricultural feedstocks are best for industrial uses?

The new paper by nova-Institute, Germany, is a contribution to the recent controversial debate about whether food crops should be used for other applications than food and feed. It is based on scientific evidence and aims to provide a more realistic and appropriate view of the use of food-crops in bio-based industries, taking a step back from the often very emotional discussion.

The authors, Michael Carus and Lara Dammer, take the position that all kinds of biomass should be accepted for industrial uses; the choice should be dependent on how sustainably and efficiently these biomass resources can be produced.

Of course, with a growing world population, the first priority of biomass allocation is food security. The public debate mostly focuses on the obvious direct competition for food crops between different uses: food, feed, industrial materials and energy. However, the authors argue that the crucial issue is land availability, since the cultivation of non-food crops on arable land would reduce the potential availability of food just as much or even more. Therefore, they suggest a differentiated approach to finding the most suitable biomass for industrial uses.

In a first step, the issue has to be addressed of whether the use of biomass for purposes other than food can be justified at all. This means taking the availability of arable land into account. Several studies show that some areas will remain free for other purposes than food production even after worldwide food demand has been satisfied. These studies also show potential for further growth in yields and arable land areas worldwide.

The second step is then to find out how best to use these available areas. Recent studies have shown that many food crops are more land-efficient than non-food crops. This means that less land is required for the production of a certain amount of fermentable sugar for example – which is especially crucial for biotechnology processes – than would be needed to produce the same amount of sugar with the supposedly “unproblematic”, second generation lignocellulosic non-food crops. Also, the long-time improvement of first generation process chains as well as the food and feed uses of by-products make the utilization of food crops in bio-based industries very efficient.

Another very important aspect that argues in favour of industrial use of food crops is the flexibility of crop allocation in times of crises. If a food crisis occurs, it would be possible to reallocate food crops that were originally cultivated for industry to food uses. This is not possible with non-food crops – they can only ensure supply security for industrial applications.

The authors therefore request that political measures should not differentiate simply between food and non-food crops, but that criteria such as land availability, resource- and land efficiency, valorization of by-products and emergency food reserves are taken into account.

This also means that research into first generation processes should be continued and receive fresh support from European research agendas and that the quota system for producing sugar in the European Union should be revised in order to enable increased production of these feedstocks for industrial uses.

And the authors ask for a level playing field between industrial material uses of biomass and biofuels/bioenergy in order to reduce market distortions in the allocation of biomass for uses other than food and feed.

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