Currently, fossil fuels account for about 80% of global energy consumption, 57% of which is in the transport sector. In the face of growing energy dependency challenges caused by dwindling oil reserves, one of the targets of the seventh sustainable development goal is to increase substantially the share of renewable energies in the global energy mix, by 2030. Thus, among the many renewable energy sources, biofuels, primarily advanced bioethanol and biodiesel, have been identified as one of the most promising alternatives to fossil fuels. However, biofuels are produced with food crops which can lead to an increase in food prices and food insecurity. According to the Food and Agriculture Organization, globally 795 million people are undernourished and the most affected are people in developing countries. Thereby, one of the targets of the second sustainable development goal is to end hunger and ensure access by everyone, especially vulnerable people, to sufficient, nutritious and healthy food all year round, by 2030. Thus, this article aims at analyzing the impacts of biofuel production, precisely biodiesel and bioethanol production on food security with the synthetic control method analysis. This method allows estimating the effects of an event or a policy, here biofuel production, by using comparative case studies. We focus on Indonesia and Mexico, the former being one of the highest palm oil and biodiesel producers, and the latter one of the highest maize and bioethanol producers. Our findings show that biodiesel production has a better impact on food security than bioethanol production. After the adoption of biofuels, the gap between Indonesia and its counterfactual clearly allows us to observe that biodiesel production has a positive effect on food security. This impact can be explained by the fact that biodiesel production uses feedstocks which do not directly compete with food crops. Furthermore, the results for Mexico clearly show that bioethanol production leads to a reduction in food security.