



Foods and fads: The welfare impacts of rising quinoa prices in Peru [☆]

Marc F. Bellemare ^{a,*}, Johanna Fajardo-Gonzalez ^b, Seth R. Gitter ^c

^a Department of Applied Economics and Director, Center for International Food and Agricultural Policy, University of Minnesota, Saint Paul, MN 55108, United States

^b Department of Economics, Universidad EAFIT, Colombia

^c Department of Economics, Towson University, Towson, MD 21252, United States



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ABSTRACT

Riding on a wave of interest in “superfoods” in rich countries, quinoa went in less than a decade from being largely unknown outside of South America to being an upper-class staple in the United States, the United Kingdom, and elsewhere. As a result, concerned commentators suggested that the rising international demand for quinoa, which tripled prices, might have substantially harmed Peruvian quinoa consumers. We study the impacts of rising quinoa prices on the welfare of Peruvian households. Our analysis suggests these fears are unwarranted. A descriptive analysis shows that quinoa is a small part (<1%) of the average household’s budget share for the roughly 30% of households that consume quinoa. Our econometric analysis generally finds that as quinoa prices rose, welfare increased in regions with higher concentrations of quinoa consumers. Specifically, we use 11 years of a large-scale, nationally representative household survey to construct pseudo-panels at three geographic (district, province, and department) levels to look at the relationship between the international price of quinoa and the value of real household consumption, our proxy for household welfare. We find for the two smaller geographic regions (i.e., districts and provinces) higher concentrations of quinoa consumption or production are associated with a small and statistically significant increase in household welfare in response to quinoa price increases; in the largest regions (i.e., departments), higher concentrations of quinoa consumption or production are associated with small declines in welfare of less than 1% of total household consumption. Our findings that the international trade of quinoa has not been harmful to household welfare in Peru thus run counter to some of the myths surrounding quinoa.

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1. Introduction

Riding on a wave of interest in so-called superfoods¹ in the United States and other rich countries, quinoa—a relatively high-

protein grain grown for millennia in the Andean regions of Bolivia, Colombia, Ecuador, and Peru—went in less than a decade from being a largely unknown commodity outside of South America to being an upper-class staple in those same rich countries.² As quinoa imports to the US increased more than tenfold from about 5 million pounds per year in 2004 to almost 65 million pounds per year in 2013 (DePillis, 2013), the price of quinoa tripled (Blythman, 2013).

Some have questioned the consequences of this increase in the international popularity of quinoa, citing concerns about the effects of rising quinoa prices on the welfare of individuals and households in places where quinoa had traditionally been produced and consumed. A January 2013 article in the *Guardian* (Manchester) made the following claim (Blythman, 2013):

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^{*} Corresponding author.

E-mail addresses: mbellema@umn.edu (M.F. Bellemare), fajar016@umn.edu (J. Fajardo-Gonzalez), sgitter@towson.edu (S.R. Gitter).

¹ The Oxford English Dictionary defines superfoods as foods “considered especially nutritious or otherwise beneficial to health and well-being” (OED, 2015).

² With 50% of Peruvian quinoa going to the United States, the United States is the commodity’s largest export market (Andina, 2016). It is followed by Canada (8%), Australia (7%), Germany (6%), the United Kingdom (6%), the Netherlands (4%), France (3%) and Israel (3%).

[T]here is an unpalatable truth to face for those of us with a bag of quinoa in the larder. The appetite of countries such as ours for this grain has pushed up prices to such an extent that poorer people in Peru and Bolivia, for whom it was once a nourishing staple food, can no longer afford to eat it.

A few days later, an article in the *Globe and Mail* (Toronto) made the opposite claim (Saunders, 2013):

The people of the [Andean plateau] are indeed among the poorest in the Americas. But their economy is almost entirely agrarian. They are sellers—farmers or farm workers seeking the highest price and wage. The quinoa price rise is the greatest thing that has happened to them.

As one might expect from media accounts, neither claim was based in serious empirical analysis.

That net buyers of a commodity are made worse off and net sellers better off, at least in the short run, by an increase in the price of that commodity is well-understood by economists (Deaton, 1989a). But what are the longer-term,³ general equilibrium effects of that price increase for consumers? And what is the effect of an international, positive price shock on the welfare of producers-cum-consumers of that commodity?

We study the welfare impacts of rising quinoa prices on those households that have traditionally consumed and produced it. To do so, we use 11 years of the Peruvian Encuesta Nacional de Hogares (ENAH), a large-scale, nationally representative household survey, to look at whether there is a systematic relationship between (i) the value of household consumption (which we use here as a proxy for household welfare; see Deaton, 1997) and the price of quinoa for those households that report consuming quinoa; and (ii) household welfare and the price of quinoa for those households that report producing quinoa.

Our study period (i.e., 2004–2014) covers years both before and after the price of quinoa rose sharply. Because the ENAH is a repeated cross-section and is thus not longitudinal, we use pseudo-panel techniques (Antman & McKenzie, 2007a, 2007b; Christiaensen & Subbarao, 2005; Cuesta, Ñopo, & Pizzolitto, 2011; Deaton, 1985; McKenzie, 2004), wherein we average over household-level measures within each geographical unit and then treat those geographical units as our primary units of observation.⁴ To study the relationship between the international price of quinoa and household consumption, we rely in turn on geographical unit (i.e., district, region, and department) fixed effects and time trends with (i) year fixed effects and (ii) higher-order geographical unit-time trends.⁵

Our work is most closely related to the literature on the effects of commodity price shocks. This is a sizeable literature wherein scholars look at the effects of commodity price shocks on a host of outcome variables, from child outcomes (Cogneau & Jedwab, 2012) to conflict (Dube & Vargas, 2013) and almost everything in between. Specifically, our work relates to the literature on the effects of commodity price shocks—usually, food price shocks—on

welfare. In a seminal contribution, Deaton (1989b) studies the effects of higher rice prices on welfare and inequality in Thailand. He finds that higher prices redistribute income towards households in the middle of the rural income distribution, with marked regional variations. More recently, Ivanic and Martin (2008) study the effects of higher global food prices on poverty in low-income countries. Using household surveys from nine low-income countries, they find that the effects of higher food prices on poverty vary by country, but also by commodity. Wodon and Zaman (2010) review the evidence looking specifically at sub-Saharan Africa, and they find that higher food prices tend to increase the extent of poverty given that net consumers tend to outnumber net producers of food. The study that is perhaps closest in spirit to our work is a study by Zezza et al. (2008), who rely on household surveys in 11 countries to look at how different groups of households are affected differently when food prices increase to look at the distributional impacts of food price changes. One notable difference between our work and most studies in the commodity price shocks literature, however, is that while that literature typically focuses on major food staples (e.g., maize, rice, wheat, etc.), we focus on a nonstaple. Additionally, the production of quinoa is concentrated in a specific region of the world, and little quinoa is produced in the United States or Europe. This makes quinoa like other regionally produced commodities, such as teff in Ethiopia and millet in Central Africa or India. The only other economic study of the effect of rising quinoa prices has been by Stevens (2017), who finds that cultural preference for quinoa in certain areas of Peru has not led to a worsening of nutritional outcomes.

The analysis uses districts, provinces and departments which are Peru's three types of geographic regions ranging in size from smallest to largest. Our results using the smallest geographic units (districts and provinces) suggest that the increased international demand for quinoa and the resulting quinoa price boom may have had beneficial effects for consumers as well as for producers of quinoa in Peru. In districts and provinces we find a positive relationship between the international price of quinoa and household welfare for regions with higher concentrations of quinoa consumption. This result suggests that the sharp increase in the price of quinoa has had positive general equilibrium effects on the welfare of the average household in those geographical unit-year observations.⁶ Specifically, we find that for a 25% increase in the price of quinoa—a change that is commensurate to the change in the purchase price of quinoa between 2013 and 2014, when international demand spiked—total household consumption for quinoa consuming households increases on average by about 1.25%. At the departmental level we find negative relationships between the variables when we include individual department trends or only quinoa producing areas. At most these negative effects are estimated at a 1% decrease in total consumption when prices double.

Second, and in line with theoretical expectations (Deaton, 1989a), we find a positive relationship between household welfare and household quinoa production at the district level of analysis. More specifically, the 25% increase in the price of quinoa between 2013 and 2014 would be associated with a 3.5% to 4% increase in consumption of quinoa producing households. At the province and department level the results are not statistically significant.

The remainder of this article is organized as follows. In Section 2, we present the data and some descriptive statistics. Section 3 presents the empirical framework we develop to study the impacts of rising quinoa prices on welfare, with particular emphasis on our identification strategy. In Section 4, we present and discuss our

³ By “longer-term,” we are referring to a time horizon that is longer (i.e., up to one year, given the frequency of our data) than Deaton's (1989a) short-term measure of welfare, and not to the long-term as it is typically understood in economics, i.e., the length of time required for all factors of production to be variable.

⁴ Peru is divided in 1838 districts in 195 provinces in 25 departments. As a first check on the robustness of our results, we estimate each set of results three times, respectively treating districts, provinces, and departments as our units of observation. We discuss our estimation strategy in more detail in Section 3. It is worth noting that Peru changed the designation of the largest sub-national units from departments to regions in 2002. However, the INEI still uses the term department in their data description, and we believe the term “department” avoids confusion with the more generic term “region.” We thus use the term “department” throughout this article.

⁵ At the district level, this means province-time trends. At the province level, this means department-time trends.

⁶ We focus on quinoa-consuming districts, households, and departments because those are the geographical units for which quinoa prices are available.

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