



# Benchmarking the profitability of raising pigs: Country comparisons and factors contributing to their relative advantage or disadvantage in a global market - 2020

Dr. Derald Holtkamp, MS, DVM, Professor of Veterinary Diagnostic and Production Animal Medicine, Iowa State Univ. (USA)

In the April 2022 report on world markets and trade of livestock and poultry, the United States Department of Agriculture's Foreign Agricultural Service estimated that 11.7 million tons of pork will be exported in 2022. Pork producers around the world are competing in a global market. While that market can, and is, distorted by politics and trade relations, the global competitiveness of individual countries still matters.

How do producers in each country stack up regarding the profitability and cost of producing pork, and what factors contribute to their relative advantage or disadvantage in a global market? Drs. Lee Schulz and Dermot Hayes in the Department of Economics at Iowa State University and I have collaborated to address this question each year since 2018. The analysis of productivity, costs, and returns presented in this article are for 2020, the most recent available, using data primarily from InterPIG, an international benchmarking network. The representatives of the seventeen participating countries in Europe, North America, and Brazil come from scientific institutions and extension services of producer organizations (Table 1). The InterPIG data is updated annually and represents a countrywide average performance of representative farms in each country.

In addition to the information from InterPIG, data for Japan, China, Vietnam and South Korea, key pork-producing and importing countries in Asia, were obtained with the help of MSD Animal Health staff and consultants. The compiled data for the countries in Asia do not necessarily represent averages for all farms in each country. The data for Vietnam, South Korea, and Japan are for modern, commercial farms of various sizes that were free of African swine fever virus (ASFV). The data for China is for modern, large-scale, single-story, non-filtered farms that were free of ASFV. In 2020, ASFV was present in China, Vietnam, and South Korea but not Japan. While the data for China, Vietnam, and South Korea was representative of farms free of ASFV, several values, such as market pig and feed prices, were significantly affected by the presence of the virus in those countries.

In 2020, the estimated cost of production from breed-to-market ranged from US\$3.97 per kg of carcass weight sold in Japan to US\$1.15 per kg of carcass weight sold in the state of Mato Grosso of Brazil, a difference of US\$2.82 between the highest and lowest cost countries (Figure 1, bars). The line in Figure 1 represents the market pig price or revenue per kg carcass weight basis.

The difference between the top of each stacked bar (total cost) and the line (revenue) represents the profit in each country. The dominant story in 2019 was China's high market pig prices in response to lower pork supply driven by African swine fever virus (ASFV). Chinese market pig prices were up 69% year-over-year in 2020 compared to 2019 resulting in a remarkable period of profitability for producers in the country despite the problems caused by ASFV.

Not surprisingly, the data shows that market pig prices and feed prices are the factors that contribute the most to the relative advantage or disadvantage in profitability for producers in each country. The next most significant factor is productivity. In this article, we will focus on productivity in each country and how much it contributes to the relative advantage or disadvantage in profitability. To assess this, we set all of the values used to estimate costs and revenue, such as market pig prices, feed prices, wage rates, etc., for each country to the same value, the average value for all countries. The productivity measures were the only value(s) that varied for each country. Any differences in profitability, therefore, were due strictly to the country's differences in productivity.

The relative advantage or disadvantage in profitability attributed to productivity for each country is shown in Table 2. The most productive producers are in Europe, except for Spain and Italy. Producers in Europe produce the most pork per breeding female per year (Figure 2). Producing more pork per breeding female spreads the fixed costs of production (buildings, equipment, breeding females etc.) over more pork, thus improving profitability. The relative advantage in profitability attributed to productivity in Italy is hampered by relatively poor whole herd feed conversion (Figure 3) because producers raise very large Italian White pigs for a premium branded ham market. Producers in Spain are relatively low-cost producers (Figure 1) by using relatively little labor and having low fixed costs, similar to the US. However, Spain and the US producers sacrifice some competitive advantage due to their relatively poor productivity.

Producers in Asia are the least productive. However, producers in Vietnam use large amounts of labor and achieve a relatively high whole herd feed conversion (Figure 3) which contributes to the relative advantage in profitability attributed to productivity there compared to other countries in Asia. As we transition to higher feed prices in 2021 and 2022, whole herd feed conversion will become an increasingly important contributor to profitability.

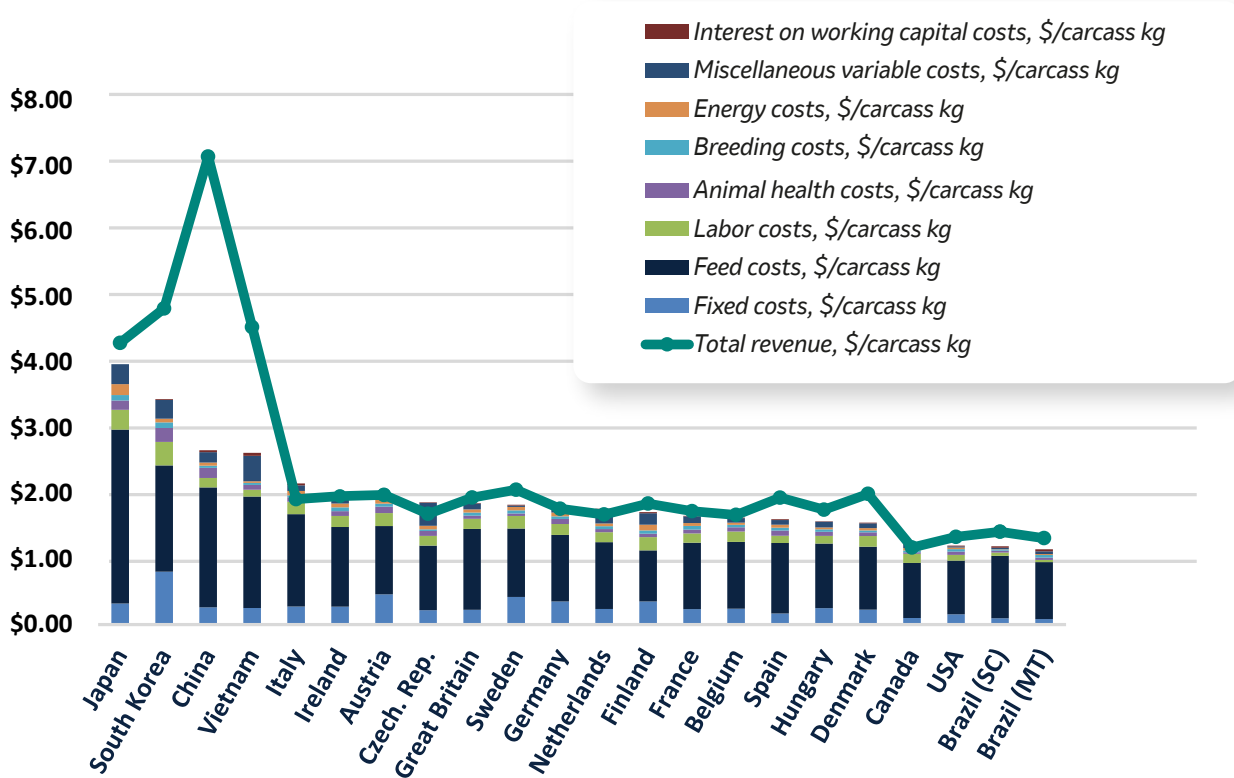
Productivity is an important factor contributing to producers' relative competitiveness, but it is not the only one. However, producers have little control over some factors, such as market pig prices and feed prices. They have more control over the pigs' health, genetics, and management, directly impacting their productivity. It is a global race to squeeze more pork out of fewer inputs. Producers in every country have considerable control over who wins that race.

**Table 1.** Members of InterPIG. InterPIG is a collaborative network involving the following organizations and countries:

<b>Great Britain - Agriculture and Horticulture Development Board (AHDB)</b>
<b>Austria - VLV Upper Austria</b>
<b>Belgium - Flemish Government and Boerenbond Belgie</b>
<b>Brazil* - Embrapa Swine and Poultry</b>
<b>Canada - Canadian Pork Council</b>
<b>Czech Republic - Institute of Agricultural Economics and Information (UZEI)</b>
<b>Denmark - SEGES</b>
<b>Finland - Atria</b>
<b>France - IFIP</b>
<b>Germany - Thuenen Institute and Interessengemeinschaft der Schweinehalter (ISN)</b>
<b>Hungary - AKI Research Institute of Agricultural Economics</b>
<b>Ireland - Teagasc</b>
<b>Italy - Research Centre for Animal Production (CRPA)</b>
<b>Netherlands - Wageningen Economic Research</b>
<b>Spain - SIP Consultors</b>
<b>Sweden - Svenska Pig</b>
<b>USA - Iowa State University</b>

*\*Brazil has two data points because of the significant differences that exist between the traditional hog farming areas of Santa Catarina(SC) and the new frontier in Brazilian pork production, Mato Grosso(MT)*

**Figure 1.** Cost of production and revenue for each country (US\$ per kg of carcass weight), breed-to-market-2020.



**Table 2.** Relative advantage or disadvantage in profitability attributed to the relative productivity\* of producers in each country (US\$/kg carcass weight), breed-to-market-2020.

Country	Productivity
Denmark	\$0.26
Ireland	\$0.23
Czech. Rep.	\$0.22
Netherlands	\$0.20
Finland	\$0.17
Great Britain	\$0.13
Brazil (SC)	\$0.13
Germany	\$0.13
Belgium	\$0.12
Brazil (MT)	\$0.09
France	\$0.09
Sweden	\$0.06
Austria	\$0.03
Canada	\$0.02
Vietnam	\$0.01
Hungary	-\$0.01
Spain	-\$0.08
USA	-\$0.11
Italy	-\$0.29
South Korea	-\$0.52
Japan	-\$0.66
China	-\$0.72

\*Productivity measures evaluated in the breed-to-wean phase included lactation length, litters farrowed/female/year, pigs born/litter farrowed, pigs born alive/litter farrowed and prewean mortality. Productivity measures evaluated in the wean-to-market phase included weight at placement, mortality rate, average daily gain, feed-to-gain ratio and carcass yield.

**Figure 2.** Total carcass weight produced per breeding female, average live weight, and number of pigs marketed—2020.

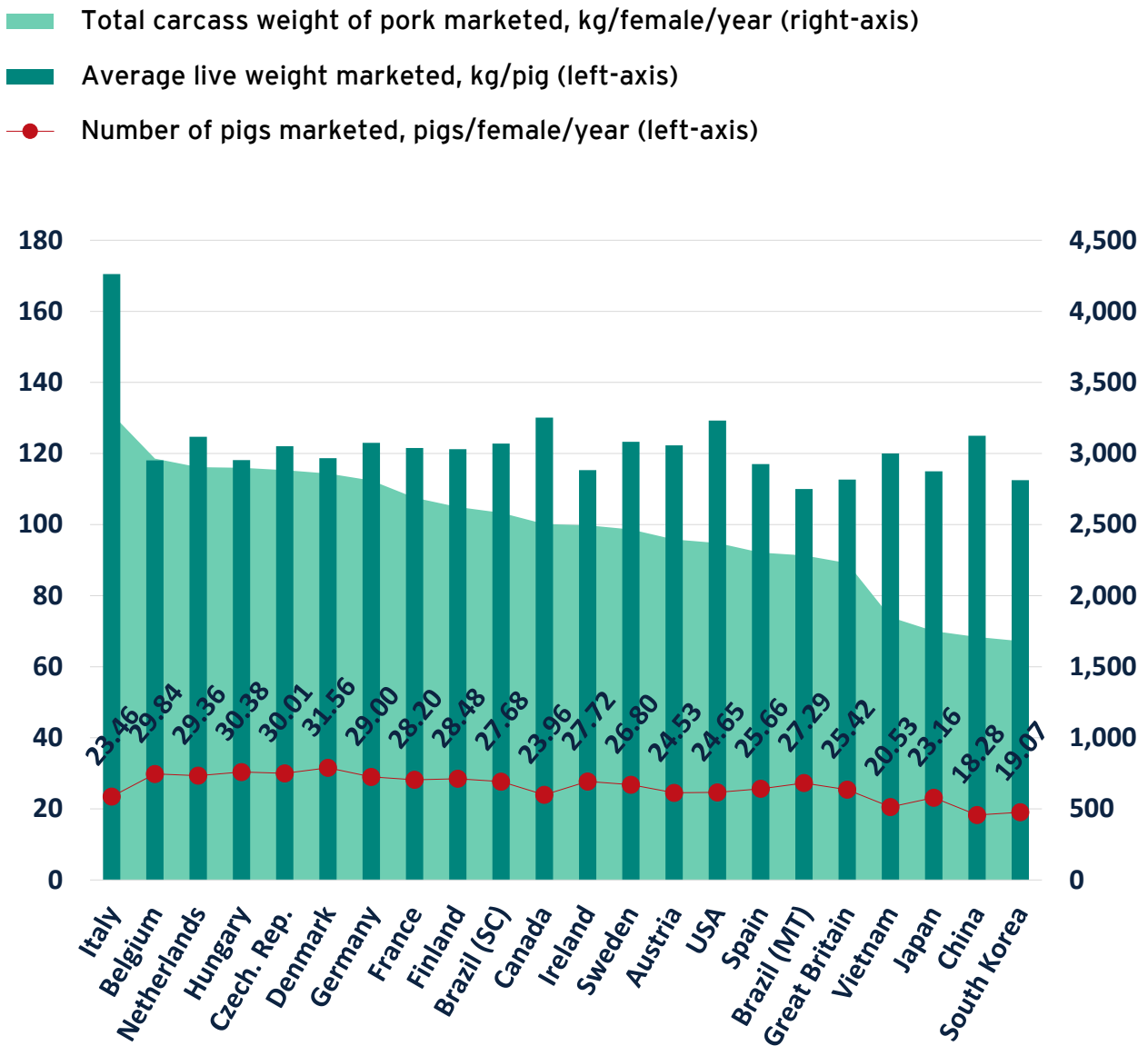
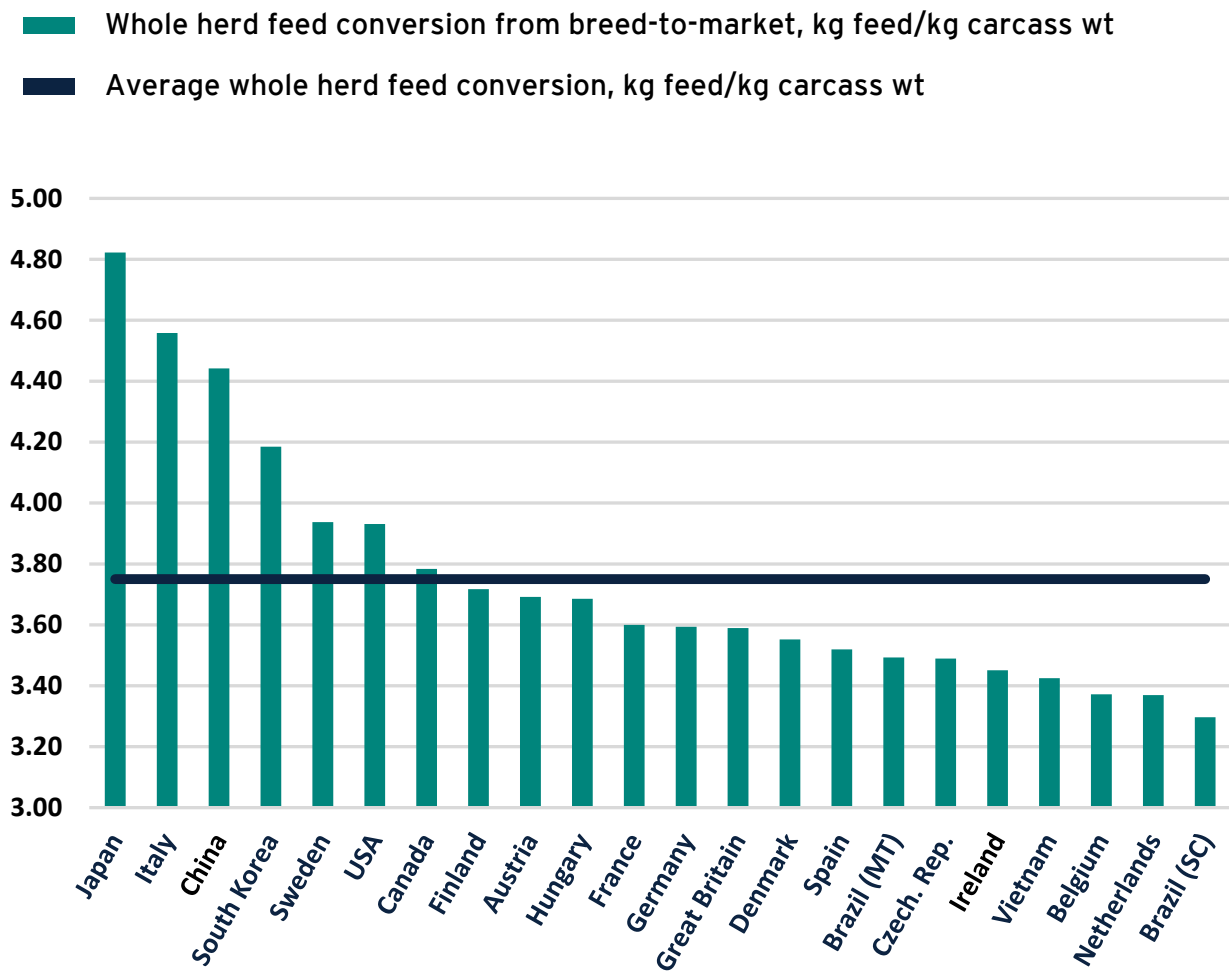


Figure 3. Whole herd (breed-to-market) feed conversion—2020.



References:

1. United States Department of Agriculture (USDA), Foreign Agricultural Service (FAS). Livestock and Poultry: World Markets and Trade. April 8, 2022.