

Dairy sector competitiveness indicators in Mexico, after NAFTA

Indicadores de competitividad del sector lechero en México, después del tratado de libre comercio

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DOI: 10.35429/EJRC.2019.8.5.1.4

Received April 20, 2019; Accepted June 03, 2019

Abstract

The main objective in this research was to calculate the competitiveness indices to the dairy sector in Mexico after NAFTA: commercial opening index, food self-sufficiency, Balassa Index, Vollerath Index, additive revealed competitive advantage index, and export-import index in a period from 1994 to 2017. The results show that the commercial opening for the whole milk is only 30 %. The self sufficiency of México in whole milk is less than 1%. The Balassa index shows that only 0.08 % of the whole milk exports in the world come from México. The Vollerath index shows that Mexico does not have commercial competitiveness in whole milk. Mexico's index of revealed additive competitiveness is of 21%. Last, the imports and exports index is less than 0.5%. Mexico's growing of milk production is not enough to satisfy the industry in the country and to reinforce has to import. Concluding that, after Nafta during more than twenty years Mexico is still whole milk import dependent from United States of America. It is recommended to make associations of dairy productive chains in the country and to explore new markets not only USA.

Competiveness, Indicators, Dairy sector

Resumen

El objetivo de esta investigación fue calcular índices de competitividad para el sector lechero en México después del TLC: índice de apertura comercial, índice de autosuficiencia alimentaria, índice de Balassa, índice de Vollerath, índice de ventaja competitiva revelada aditiva e índice de exportaciones e importaciones en un periodo de 1994 a 2017. Los resultados muestran que la apertura comercial para la leche entera es sólo del 30%. La autosuficiencia de México en leche entera es menor al 1%. El índice de Balassa muestra que sólo 0.08 % de la leche entera en las exportaciones mundiales es proveniente de México. El índice de Vollerath muestra que México no tiene competitividad comercial en leche entera. El índice de Competitividad revelada positiva es de 21%. Por último el índice de importaciones y exportaciones es menor a 0.5%. El crecimiento en la producción de leche en México no es suficiente para satisfacer la industria en el país y para reforzarla tiene que importar. Concluyendo que, después del TLC durante más de 20 años México es aún dependiente en importaciones de Estados Unidos de América. Se recomienda realizar asociaciones en las cadenas productoras de lácteos en el país y explorar nuevos mercados no sólo EUA.

Competitividad, Indicadores, Sector lechero

Citation: ESTRADA-CHAVIRA, María Eugenia, HERNÁNDEZ-VELÁZQUEZ, Maribel Rocío and GUERRERO-GARCÍA, Sylja Viridiana. Dairy sector competitiveness indicators in Mexico, after NAFTA Journal- Republic of Cameroon. 2019 5-8: 1-4

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Introduction

The agricultural production systems are structured by defined activities, according to the production resources availability, productivity and income; and are justified by the existence of important differences in the available resources, applied technology and generated products, (Herrera *et. al.*, 2013).

The dairy products represent around 14% of the world agricultural commerce. The cow milk is formed of 87 % of water, while other 13% is formed of proteins, fats and lactose. The two most important products in the marketing around the world are: The whole milk and the skim milk powder. The most important dairy producers in the world are: U.S.A., China, Brazil, and Germany.

In Mexico, the milk production is around 939,156 thousand liters. But, the demand has been raised (260,765 thousand liters) in the last years and there is a necessity to import (268,824 thousand liters) mainly from U.S.A.

The process to calculate the indices there was consulted in different sources cited in the references, also, the period taken was from 1994 to 2017. The variables consulted were: imports, exports, production, from web pages as: SIAP (Servicio de información Agroalimentaria y pesquera). SIAVI (Sistema de información arancelaria vía internet), SAGDER (Secretaría de Agricultura y Desarrollo Social). Banco de México, among others.

The article is structured, first, there is a short introduction, after, an explanation about the indexes, then the indexes are calculated and analysed, after that, the results are presented and finally the conclusions and recommendations are stated.

Indices

1. Commercial Opening Index

This index is calculated with the sum of imports and exports as a percentage of the national production.

2. Food Self-sufficiency

This index defines the country competitiveness in relation to its food self-sufficiency.

3. Balassa Index or Exported Competitive Advantage Index of Exports

This index measures the relative performance of the exports by country and sector, in comparison with the participation in the world exports.

4. Vollrath Index or relative commercial advantage

Measures the productive-commercial competitiveness of a country.

5. Competitive Advantage Index Revealed Additive

This index is calculated in relation to the world production of a country and it is based mainly in the general equilibrium theory.

6. Imports and Exports Index

Measures the dynamic of a country between Exports and imports

Methodology

As methodology, a mix method between a qualitative and quantitative research was used; because the information was collected from web pages. After that, it was processed according to each formula. The period taken in account was from 1994 to 2017. The selected as representative product of the dairy products was the whole milk, even thought, the indexes were calculated for other types of milk.

The used formulas were:

1. Commercial Opening Index

$$COI_{Mex}^Z = \left[\frac{(X_{Mex}^Z + M_{Mex}^Z)}{GDP_{Mex}} \right] \quad (1)$$

Where:

Z = Whole milk product

COI_{Mex}^Z = Commercial Opening Index of Z

X_{Mex}^Z = Exports of Z From Mexico

M_{Mex}^Z = Imports of Z in Mexico

GDP_{Mex} = Mexico's Gross Domestic product

2. Food Self-Sufficiency

$$FSS_{Mex}^Z = \left[\frac{P_{Mex}^Z}{(P_{Mex}^Z + M_{Mex}^Z) - X_{Mex}^Z} \right] \quad (2)$$

Where:

FSS_{Mex}^Z = Food Self Sufficiency Index of Z in Mexico

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X_{Mex}^Z = Exports of Z in Mexico.

M_{Mex}^Z = Imports of Z in Mexico.

P_{Mex}^Z = Production of Z in Mexico.

X_{Mex} =Exports from Mexico

3. Balassa Index or Exported Competitive Advantage Index of Exports (BI)

$$BI_{Mex}^Z = \frac{X_{Mex}^Z / XT_{Mex}}{X_{USA}^Z / XT_{USA}} \quad (3)$$

Where:

X_{Mex}^Z = Exports of Z From Mexico

TX_{Mex}^Z = Total Exports of Z in Mexico

X_{USA}^Z = Exports of Z From USA

TX_{USA}^Z = Total Exports of Z in USA

4. Vollrath Index or relative commercial advantage (VI_Z)

$$VI_Z = \frac{X_{Mex}^Z / XT_{Mex}}{X_{USA}^Z / XT_{USA}} - \frac{M_{Mex}^Z / MT_{Mex}}{M_{USA}^Z / MT_{USA}} \quad (4)$$

Where:

X_{Mex}^Z = Exports of Z From Mexico

TX_{Mex}^Z = Total Exports of Z in Mexico

X_{USA}^Z = Exports of Z From USA

TX_{USA}^Z = Total Exports of Z in USA

M_{Mex}^Z = Imports of Z From Mexico

MT_{Mex}^Z = Total Imports of Z in Mexico

M_{USA}^Z = Imports of Z From USA

TM_{USA}^Z = Total Imports of Z in USA

5. Competitive Advantage Index Revealed Additive

$$CAIRA_{Mex}^Z = \left[\left(\frac{X_{Mex}^Z}{TX_{Mex}^Z} \right) - \left(\frac{X_{World}^Z}{TX_{World}^Z} \right) \right] \quad (5)$$

Where:

X_{Mex}^Z = Exports of Z From Mexico

TX_{Mex}^Z = Total Exports of Z in Mexico

X_{World}^Z = Exports of Z From the world

TX_{World}^Z = Total Exports of Z in the World

6. Imports and Exports Index

$$IEI_{Mex}^Z = ERA_{Mex}^Z - MRA_{Mex}^Z \dots \dots \quad (6)$$

Where:

$$ERA_{Mex}^Z = \frac{X_{Mex}^Z / TX_{Mex}}{X_{USA}^Z / TX_{USA}}$$

$$MRA_{Mex}^Z = \frac{M_{Mex}^Z / TM_{Mex}}{M_{USA}^Z / TM_{USA}}$$

IEI_{Mex}^Z = Exports and imports of Z in Mexico.

ERA_{Mex}^Z = Exports Revealed Advantage

MRA_{Mex}^Z = Imports Revealed Advantage

Z= Whole milk

Results

Applying the formulas for the Exports and Imports, Production of Whole milk in Mexico in comparison with the USA, the results were:

Concept	Index
Commercial Opening Index	32.60
Food Self - Sufficiency	0.0005
Balassa Index or Exported Competitive Advantage Index of Exports	0.086
Vollrath Index	-0.250
Competitive Advantage Index Revealed Additive	21.33
Imports and Exports Index	0.46

Table 1 Trade indexes for whole milk in Mexico after NAFTA

Source: Own elaboration

The Commercial Opening index means that 30 % of the international market dynamism is of whole milk in Mexico with relation to the domestic production.

The country competitiveness of the whole milk in relation to Mexico's food self-sufficiency is less than 1%. The Balassa index of less than 1% measures the relative performance of the exports by country and sector, in comparison with the participation in the world exports. This index indicates that the whole milk Mexican production is only 20% of the world production

The Imports and Exports Index is of 0.46. That means that the dynamic of the international market is very low.

Conclusions and Recommendations

Development of the primary production in Mexico is important and shows indexes higher than the population growing, but it is not enough to satisfy the dairy industry, having the necessity to import whole milk mainly from the USA.

It is recommended to make associations of dairy products to reinforce the production. Also, to explore the international markets not only to U.S.A.

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