Peanut Agricultural and Industrial Sector chiefly extend across the Province of Córdoba and constitute a flagship regional economy. Argentina is the main world exporter of peanuts with over 400,000 tons per year, which are mainly destined for European Union (EU) by more than 70% of exports.

The main health-risk factor is the presence of mycotoxins in peanuts, mainly aflatoxins AFG2, AFG1, AFB2 and AFB1, which are produced by filamentous mold of the genus *Aspergillus*, more specifically by *A. flavus* and *A. parasiticus*.

AFB1 was classified by the World Health Organization as a carcinogen in humans. Therefore, the international community has set limits for these aflatoxins. At least 99 countries have regulations for mycotoxins in food or feed; the tightest was set by the EU regulation 165/2010 with a maximum value of 2 μg/kg for AFB1 and 4 μg/kg for total aflatoxins.

For monitoring compliance with these limits, the Health Authority in Argentina (SENASA) has established criteria according to the EU requirements. This has set a monitoring system that informs the consumer risks immediately on arrival by preventing the entry of contaminated products.

It is important to determine the occurrence of aflatoxin in peanut Argentina crops, in the main variety of the region, and to establish certain criteria to minimize contamination. Furthermore, it is essential to develop a method of analysis and a system of control risk through the blanching process.

The aim of this thesis was to sample and analyze three agricultural cycles of more than 150,000 tons of peanuts from the central-southern of Cordoba province to determine the occurrence of aflatoxin in growing as a result of weather conditions.

It was developed and validated a simple, accurate and economical analytical method based on high performance liquid chromatography performance for the detection and quantification of aflatoxins, AFG2, AFG1, AFB2 and AFB1. Returned values of detection limits were AFG2 = 0.22 μg/kg, AFG1 = 0.37 μg/kg, AFB2 = 0.12 μg/kg and AFB2 = 0.18 μg/kg with an average recovery rate of 83.4% for total aflatoxins. By this way as possible to meet the requirements of the EU and the USA.

Analytical results indicate that, in the south-central region of Córdoba, aflatoxin contamination does not have a high incidence on the peanuts. Maximum impact on the occurrence of aflatoxins was 2.5% for 2012/2013 production cycle and an average value of 1.3% for the three annual periods studied.

It was found that the total water requirements for peanut cycle are important for the implementation and development of the crop as well as to achieve high yields. However, to prevent fungal growth and subsequent generation of aflatoxins, it is determining to mitigate water stress and apply pest control measures, from formation to grain filling -in R2 to R4 growth stages- taking place from February to end March.

It was also found that in this region the crop is virtually mono-varietal where a runner-type peanut *Granoleico* prevails over other varieties. The average values of oleic acid in the samples were 78.97 ± 2.29%.

During crop reception from the fields, samples moisture and damaged kernels were determined. Also the storage conditions were controlled. Finally, criteria that would allow implement of hazard analysis and critical points control system during critical stages of the crop, were established.

Due to the dry blanching process of batches with aflatoxin (with a mass flow of 2,000 kg / h in two consecutive steps of electronic color sorting) and the treatment of rejected kernels (due to the high incidence of damage and defects, with hydrogen peroxide at 0.5% v/v concentration) was possible to reduce AFB1 83.31 ± 15.98% and total aflatoxin up to 17.33 ± 75.99% with weight loss less than 6% w/w. It can be considered as a step that could reduce the food safety hazard of aflatoxin to an acceptable level.

Finally, using a logarithmic equation knowing the initial concentration of aflatoxin, peanut industry could predict the behavior of blanching process and determine the aflatoxin final concentration in lots for export without losing resources.