



# PNAEQ – Parasite Morphology Program

## Performance evaluation of participants between 1995-2014

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### Introduction

In PNAEQ (Programa Nacional de Avaliação Externa da Qualidade), the Parasite morphology program, has been implemented since 1995.

The collaboration of experts has been an asset in sample selection and results analysis, aimed at continuous improvement of the performance of the laboratories participants. The program includes three annual distributions, being sent at least one stool and one blood sample per distribution.

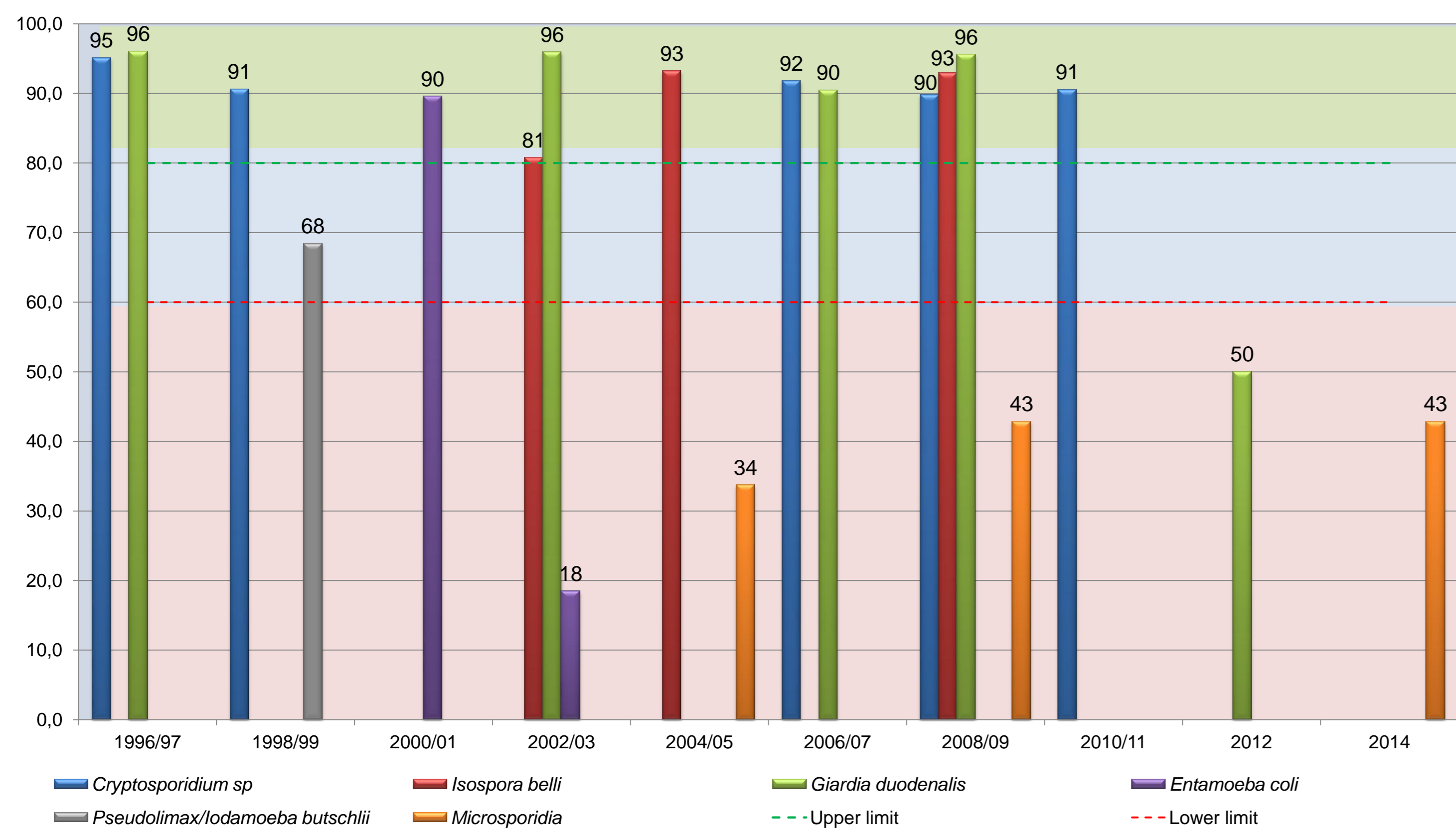
### Aim

In this retrospective study, we intend to evaluate the participant performance since the beginning of the program until 2014, regarding the correct identification of stool and blood specimens. The stages differentiation and quantification will be the subject of future analysis.

### Material and Methods

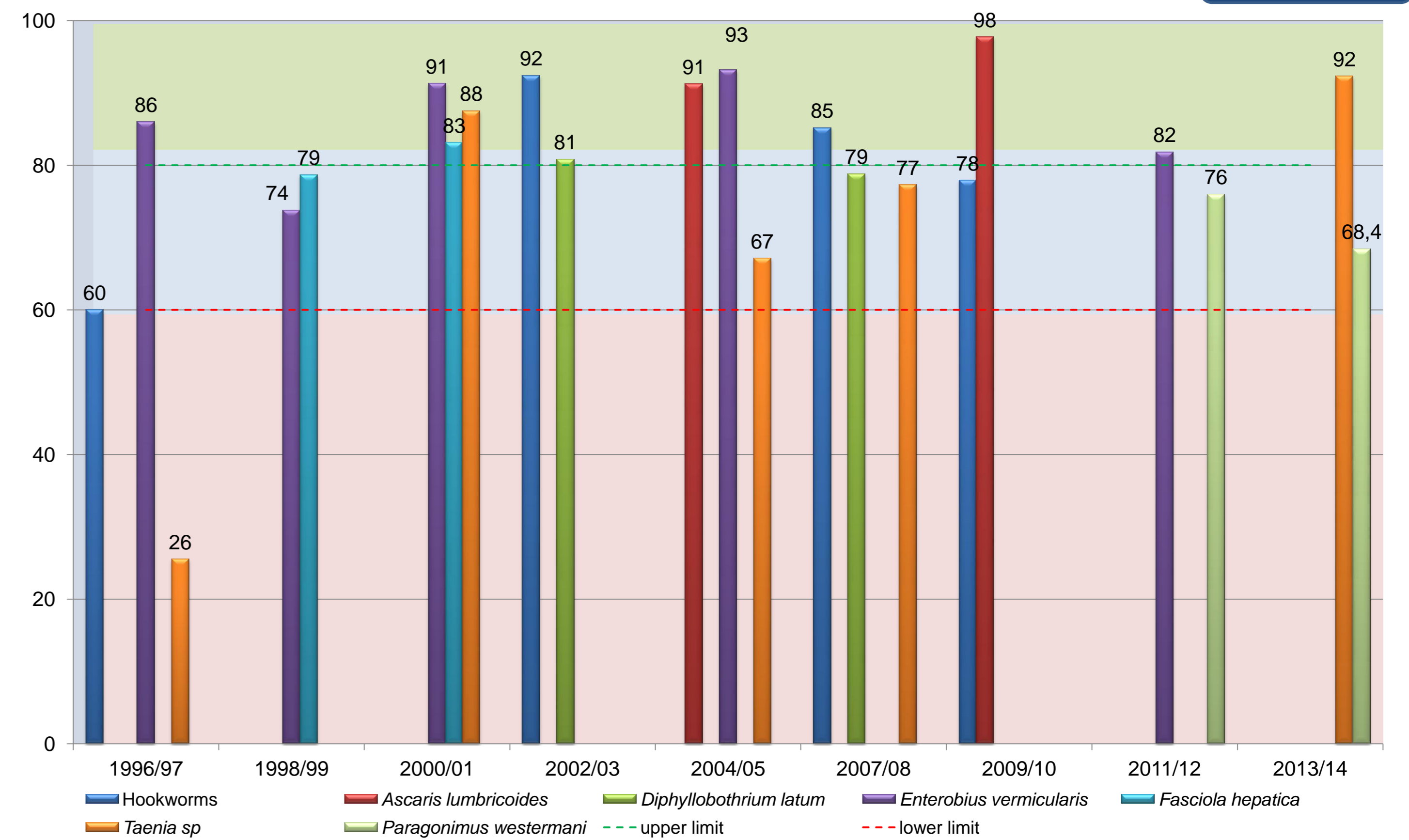
A total of 126 samples containing protozoa and helminths (29 species) were sent between 1995-2014. A qualitative statistical analysis, of the identification of stool and blood specimens, was applied taking into account the parasite presence in the sample. An assessment was performed by the PNAEQ experts, always with a formative character. The analysis of the participant's results was accomplished, considering the biological product and the number of parasites present in each sample.

Graph 1



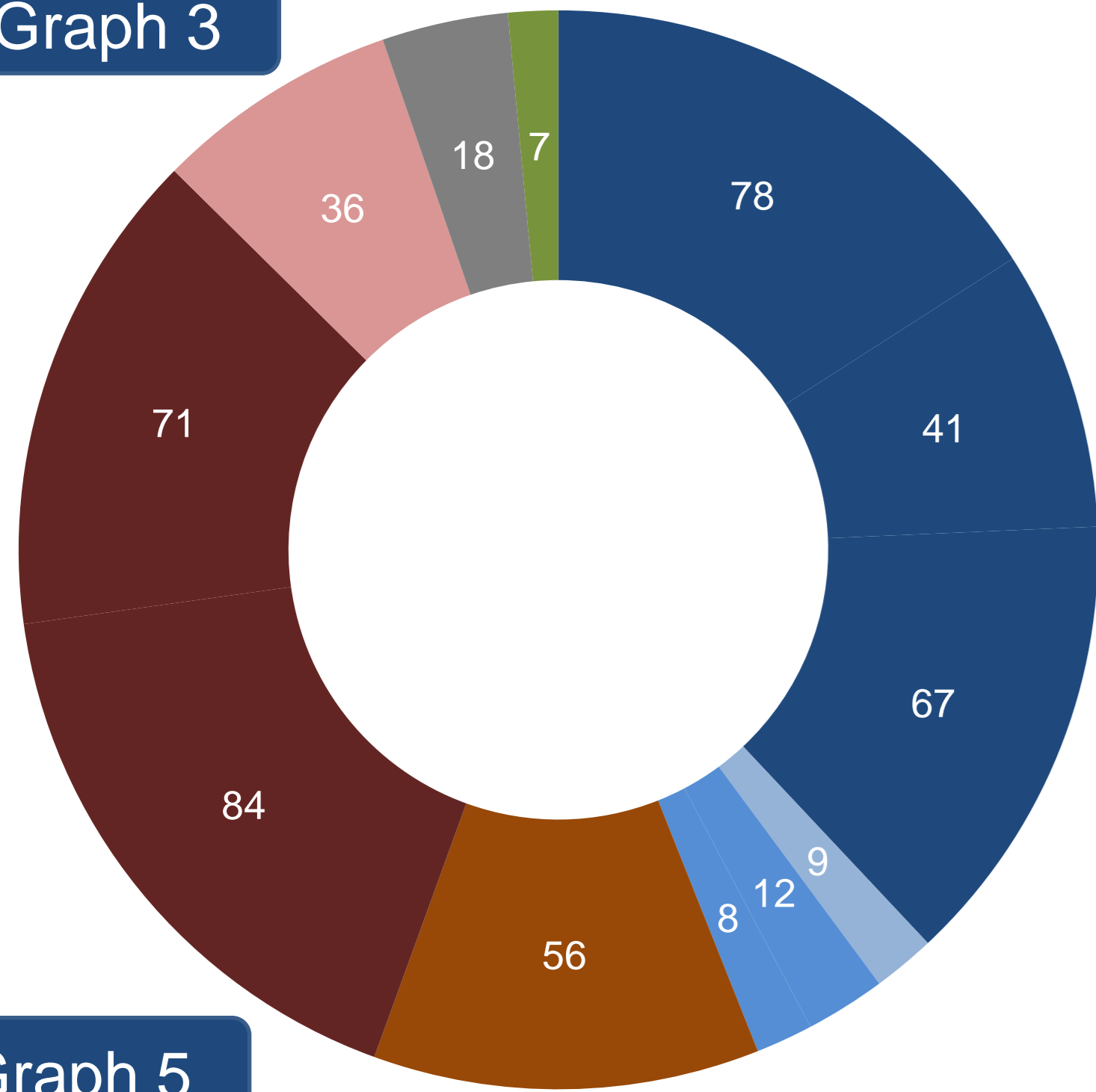
### Results

Graph 2



It was established an upper limit (80%) and a lower limit (60%) for good and not acceptable results, respectively. For stool samples the graphics show the percentage of correct results for Protozoa (Graph 1) and Helminths (Graph 2). 76% and 79% of the results were above the upper limit for protozoa and helminths, respectively.

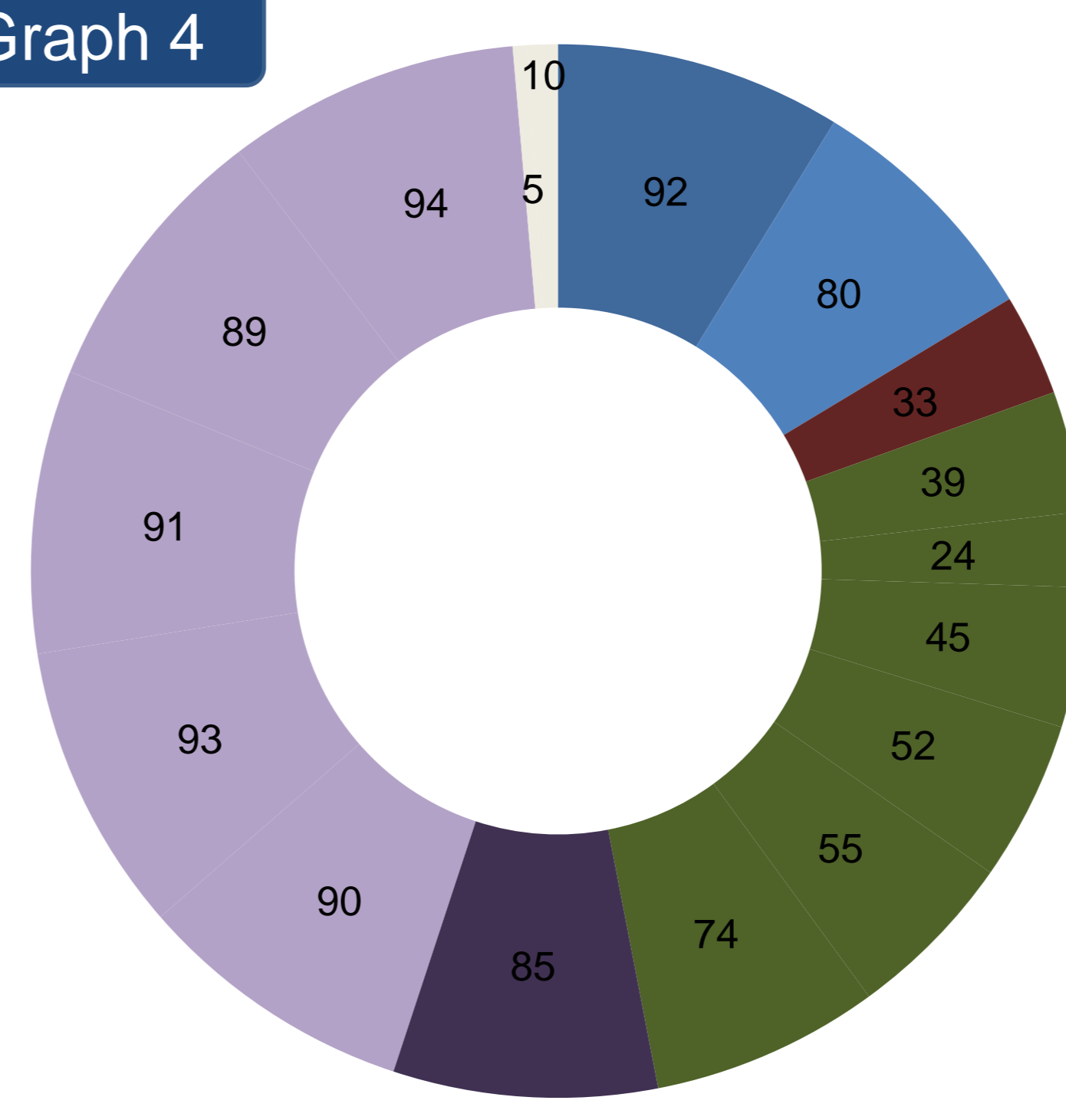
Graph 3



Samples with more than one specimen show that when the most common are present (for instance: *A. lumbricoides* and *G. duodenalis*), there was a better laboratory performance (Graph 3). Samples with more than three protozoa are considered very difficult, presenting a low percentage of correct results.

- Ascaris lumbricoides, Trichuris trichiura
- Ascaris lumbricoides, Endolimax nana
- Entamoeba coli, Endolimax nana
- Giardia duodenalis, Taenia sp
- Giardia duodenalis, Ascaris lumbricoides
- Giardia duodenalis, Hookworms
- Giardia duodenalis, Ascaris lumbricoides, Trichuris trichiura
- Entamoeba histolytica, Entamoeba hartmanni, Pseudolimax buetschlii e Giardia duodenalis

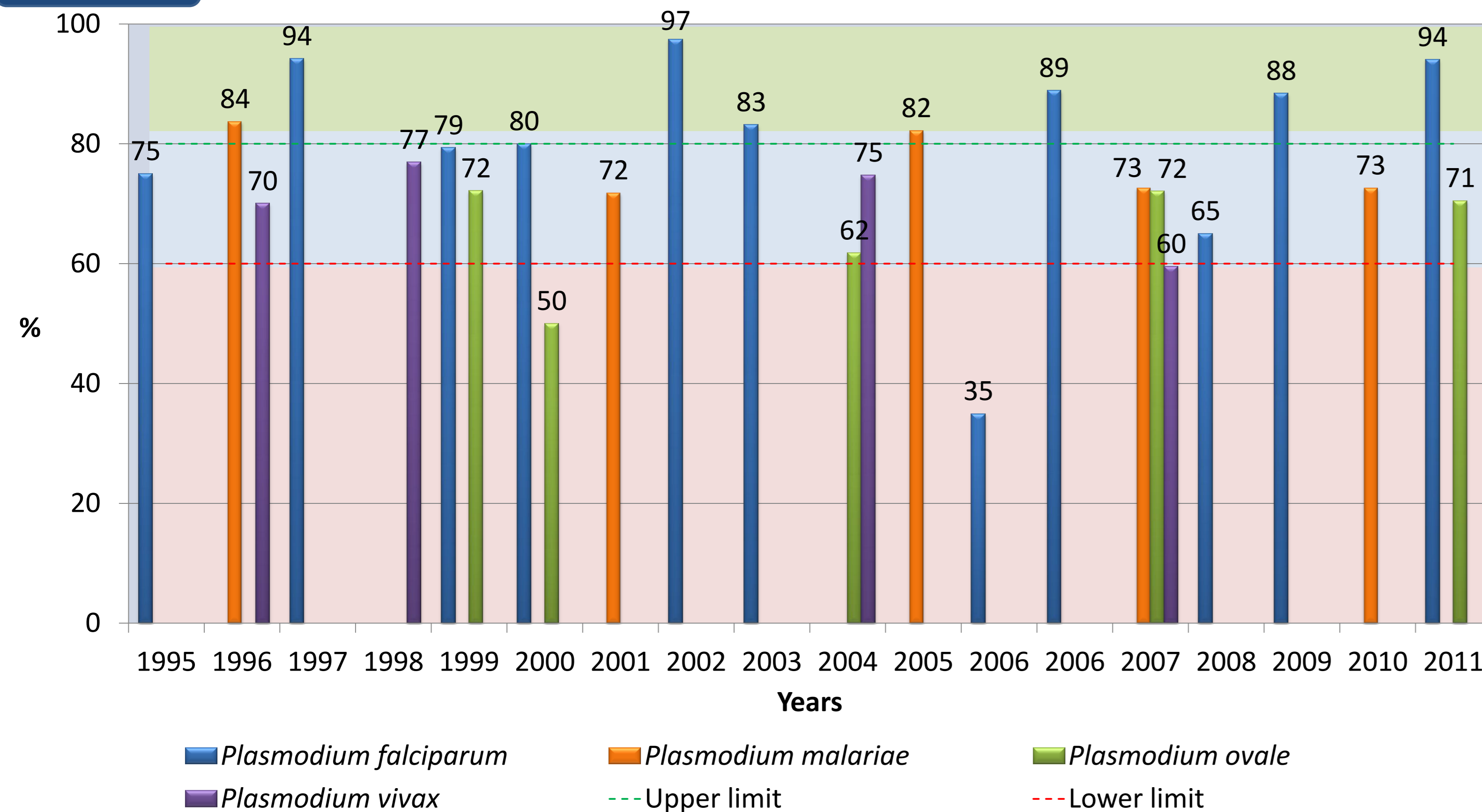
Graph 4



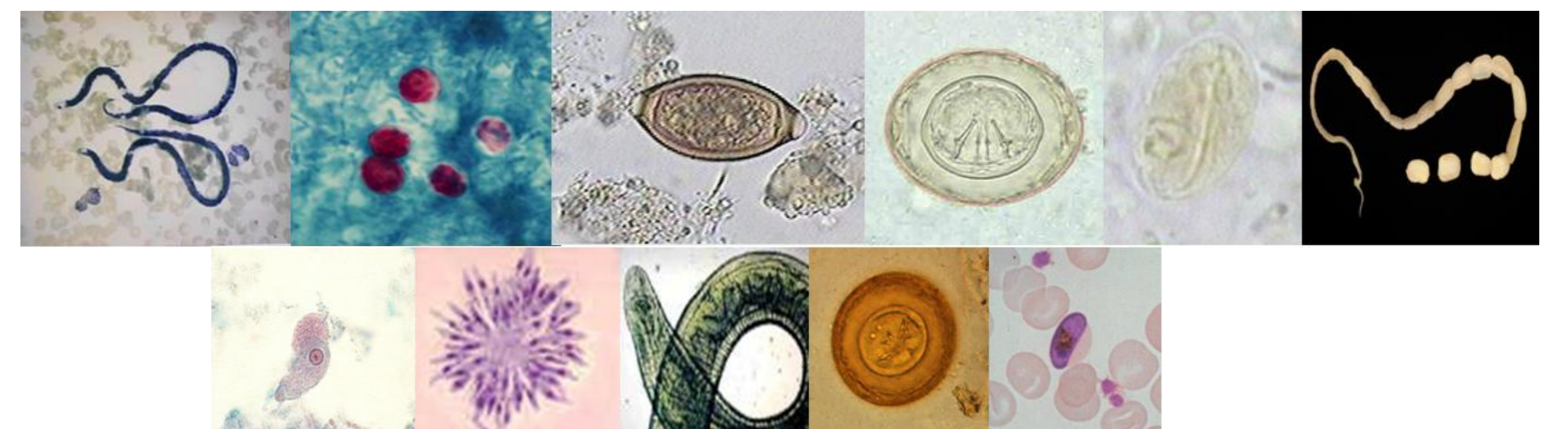
Graph 4 represents the correct results for the blood specimens identification. Blood smears with *Trypanosoma brucei* tripomastigotes and *Leishmania* sp. promastigotes from culture showed the best performance. Otherwise, identification of *Microfilariae* species showed a very low percentage. A percentage of 10% correct results for samples containing more than one species of *Microfilariae* was obtained.

- Leishmania donovani
- Leishmania sp
- Wuchereria bancrofti
- Loa loa
- Trypanosoma brucei gambiense
- Trypanosoma brucei
- Loa loa, Mansonella perstans

Graph 5



Graphic 5 represents the percentage of results for blood samples, containing different species of *Plasmodium*, 36% were above the upper limit and 56% were above the lower limit. Blood samples containing *P. falciparum*, were easily identified, confirmed by low performance only for a single sample. This was due to the sample contain young and mature trophozoites with a 3% parasitemia. The results of the identification of the double sending the same blood sample to the participating laboratories, containing a double infection of *Plasmodium* (*P. ovale* and *P. malariae*), showed that only 13.5% (5/37) of the results were correct.



### Conclusion

- ☺ We observe a fluctuation in the results of the participants' performance over the period analyzed, as well as the performance of the laboratories in the identification of stool samples was greater when compared to blood samples.
- ☺ We believe that the investment on this formation program has been a great asset and should continue in the future by improving the performance of participating laboratories.
- ☺ In the future, PNAEQ will invest in sending blood and stool samples with more than one parasite to improve training of collaborators.