Veterinary epidemiological study of SARS CoV-2 in Gran Canaria

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1. ABSTRACT

Coronaviruses (CoVs) infections are common in animals and humans, with some strains being zoonotic. The current COVID-19 pandemic originated in China and has spread globally, with millions of cases reported worldwide. Cases of SARS-CoV-2 infection have been identified in animals such as cats, mink and dogs, raising concerns about interspecies transmission. The importance of understanding the susceptibility of different animal species to SARS-CoV-2 and assessing the dynamics of infection in susceptible animal species is crucial for human and animal health, wildlife conservation and biomedical research. A total of 177 animals were included in the study, from those who had blood samples and nasopharyngeal swabs collected. The objective of this study is to evaluate the epidemiological situation of SARS-CoV-2 in Gran Canaria.

2. INTRODUCTION

Coronaviruses (CoVs) are a family of RNA (ribonucleic acid) viruses, named for the characteristic corona of spike proteins around the lipid envelope. They possess a linear genome of single-stranded positive linear RNA. In humans, CoV can cause different diseases, from the common cold to severe illnesses such as Middle East Respiratory Syndrome (MERS-CoV) or Severe Acute Respiratory Syndrome (SARS-CoV). They can also cause respiratory, liver, enteric and neurological disorders in mammalian and avian species (Ramanujam et al., 2022; Shang et al., 2020).

CoV infections are common in animals and humans, with some strains being zoonotic. Six human coronaviruses (HCoVs) have been identified, including HCoVs-NL63 and HCoVs-229E (alpha-CoVs), HCoVs-OC43, HCoVs-HKU1, SARS-CoV and MERS-CoV. These viruses can be transmitted between animals and humans. Previous research has shown that SARS-CoV was transmitted from civet to humans and MERS-CoV from dromedary camels to humans. These animals can become secondary viral hosts and even reservoirs of disease (Delahay et al., 2021; Wu et al., 2020).

Chinese authorities identified, in December 2019 in Wuhan city, capital of Hubei province, China (People's Republic of), a novel CoV as the causative agent of human cases of pneumonia of unknown origin (Gaudreault et al., 2020; Zhang et al., 2020).Several intermediate hosts, such as Malayan pangolins, cats, civet and dromedary camels, have been considered due to the lack of credible evidence supporting direct transmission from bats to humans(Gaudreault et al., 2020; Islam et al., 2022). The genetic make-up of the virus reveals that it is a chimera of bat CoVRaTG13 and the receptor binding domain (RBD) of pangolin CoV, optimized to bind to the angiotensin-converting enzyme-2 (ACE-2) receptor in human cells (Ramanujam et al., 2022)

The International Committee for Taxonomy of Viruses (ICTV) has named the CoV that causes COVID-19as SARS-CoV-2, and is a virus of the family Coronaviridae, genus Betacoronavirus. It is characterized by spicules on its surface, which give it a corona-like appearance. The life cycle of SARS-CoV-2 begins when these spicules proteins bind to receptors on the surface of human cells, allowing the virus to enter. Once inside, the viral RNA replicates using the host cellular machinery to produce new viral particles, which are then released to infect other cells (Wu et al., 2020).

Since then, nearly every country in the world has reported human cases and the World Health Organization (WHO) has declared this disease (COVID-19) a pandemic. The European Centre for Disease Prevention and Control (ECDC) and the WHO suggested the implementation of surveillance systems to detect the virus in patients hospitalized for severe acute respiratory infection (SARI).

Sentinel surveillance is the most efficient way to collect high-quality data in a timely manner, drastically reducing the amount of resources required compared to the universal surveillance system (Red Nacional de Vigilancia Epidemiológica, 2023). The use of equipment for the diagnosis and genetic characterization of the COVID-19 virus was and remains necessary for controlling and mitigating of the disease. Sequencing technologies implemented by public health agencies in Europe (Public Health England) and North America (Centers for Disease Control and Prevention, Public Health Agency of Canada) have enabled the specific identification of transmission hotspots. This information for evidence-based decision-making to prevent the spread of disease and to implement early warning systems for coronavirus (Álvarez-Díaz et al., 2020).

The current pandemic is ongoing through human-to-human transmission of SARS-CoV-2. Available information suggests that this new CoV is of animal origin; genetic sequencing indicates that SARS-CoV-2 is closely related to another CoV circulating in populations of bats of the genus *Rhinolophus* (horseshoe bats). Further research is required to identify the exact source, determine how the virus was introduced into the human population and to establish the possible role of animals in this disease (Islam et al., 2022; Zhang et al., 2020).

The global incidence of COVID-19 is of a large magnitude, with more than 775 million cases reported worldwide according to WHO. The United States of America and China have the most reported cases, 103 million and 99.4 million respectively, followed by India with 45 million cumulative cases. However, in the last month Russia is the country with the most cases: 39,000, representing 30.4% of the total number of current cases (128,000). Likewise, Spain has a count of 14 million cases reported so far, although the WHO has not recorded the data for the last month in Spain, we can review the sentinel data of primary care for 2024: 151 SARS-COV-2 infections have been detected in 355 tests, representing 42.5% of positive cases.

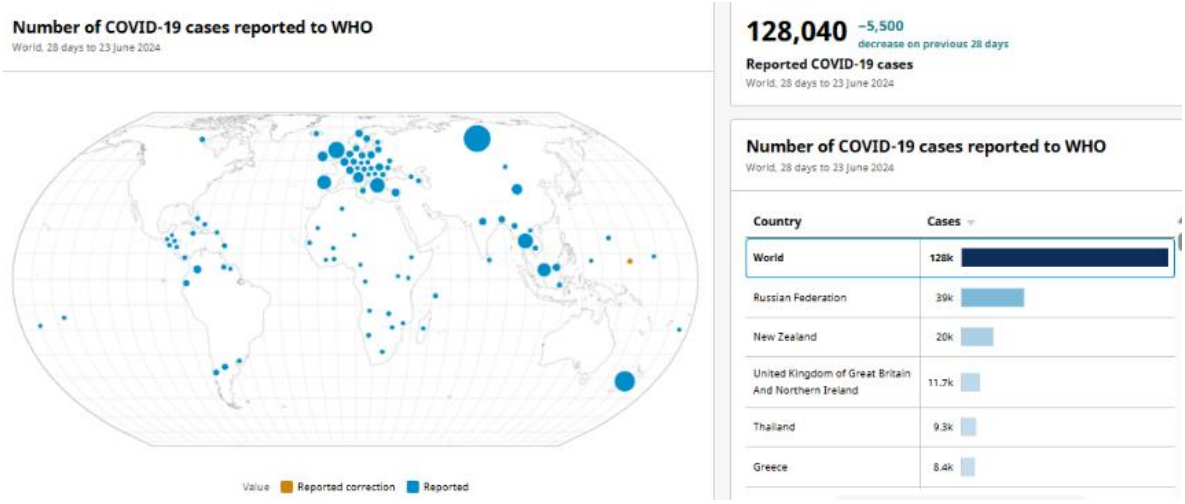

Figure 1. Distribution of currently reported cases worldwide. Image extracted from the official WHO website, 2024. (COVID-19 cases | WHO COVID-19 dashboard)

SARS-COV-2		
Number of test	**Number of detections**	**Positivity (%)**
355	**151**	**42.5**

Table 1. Percentage of positive cases in primary care sentinels in Spain. Table extracted from the official website of the European Centre for Disease Prevention and Control, and European Respiratory Virus Surveillance Summary. (erviss.org)

Meanwhile, in the Canary Islands, the data on occupancy in public centers of patients admitted for COVID-19 provided by the Healthcare Quality Assessment and Information Systems Service belonging to the General Directorate of Healthcare Programmes through the latest weekly report on acute respiratory infections are as follows:

In the last month, the number of beds occupied by COVID-19 patients has increased, from 40 beds on 4 June to 102 beds on 2 July, an occupancy rate of 2.43%.

	Beds occupied by COVID-19 patients	% Ocupation
02/04/2024	13	0.31%
01/05/2024	7	0.17%
04/06/2024	40	0.96%
16/06/2024	75	1.81%
02/07/2024	102	2.43%

Table 2. Beds occupied by COVID-19 patients and percentage of occupation of public hospitals in the Canary Islands, season 2023-24. Table extracted from the weekly report (26) on acute respiratory infection surveillance.(Informe semanal (gobiernodecanarias.org))

Since SARS-CoV-2 infections have become widely distributed in the human population, cases of infection have been described in certain animal species through close contact with infected humans. Specifically, cats (domestic cats and big cats), mink and dogs have tested positive for SARS-CoV-2 following contact with persons known or suspected to be infected. The disease manifestations differ between infected animal species. Cats appear to be the species most susceptible to SARS-CoV-2 as they have manifested clinical signs such as respiratory and gastrointestinal symptoms. In contrast, SARS-CoV-2 infection in farmed mink has been characterized by respiratory disease and increased mortality rates (Chaintoutis et al., 2021; Fenollar et al., 2021; Oude Munnink et al., 2021). Dogs appear to be less susceptible to infection than ferrets and cats. Under laboratory conditions, cats have been able to transmit the infection to other cats and ferrets were susceptible to infection and transmitted the infection to other ferrets, although they appear to be less affected by clinical disease (Shi et al., 2020).

The impact of the disease on terrestrial and marine wildlife remains unknown, though the presence of the virus has been demonstrated in sewage that could contaminate the environment through discharges (Hu et al., 2015; Wu et al., 2020).

Studies are currently underway to better understand the susceptibility of different animal species to SARS-CoV-2 and to assess the dynamics of infection in susceptible animal species. SARS-CoV-2 infection in animals may have implications for human and animal health, animal welfare, wildlife conservation and biomedical research. Additionally, possible infection in food-producing animals could have implications for food safety (Zhao et al., 2024).

Severe acute respiratory syndrome-related coronavirus disease is currently a major global concern. Therefore, it is vital to implement systems that offer the possibility to record the incidence of COVID-19 and the evolution of SARS-CoV-2 variants due to the rapid evolution of the virus. The sentinel surveillance system for acute respiratory infections is relied upon as the main strategy (Red Nacional de Vigilancia Epidemiológica, 2023).

Given this context and considering the strategic ecological, economic-social and epidemiological situation of the Canary Islands, along with the significant influence of zoonotic diseases with similar characteristics to the disease caused by SARS-COV-2 and their impact on the health, economy and prosperity of the population, the following objectives has been set.

3. OBJECTIVES OF THE STUDY

1.- Assessment of the epidemiological situation of SARS-CoV-2 in companion animals in Gran Canaria that have been in close contact with a person/owner infected or not with SARS-CoV-2.

2. - Evaluation of the epidemiological situation of SARS-CoV-2 in slaughter animals from Gran Canaria.

3. - Know the prevalence and seroprevalence of SARS-CoV-2 in wildlife animals and cat colonies from Gran Canaria animals.

4. MATERIALS AND METHODS

4.1 Sample collection

A total of 177 animals were included in the study: 50 cattle (*Bos taurus*), 41 small ruminants (22 caprine, *Capra aegagrus hircus*, and 18 ovine, *Ovis orientalis aries*), 30 pig (*Suis domesticus*), 30 rabbits (*Oryctolagus cuniculus*), 8 cats (*Felis catus*, 7 colony cats, 1 pet cats), 8 North African hedgehog (*Atelerix algirus*), 3 Scopoli's shearwater (*Calonectris diomedea*), 2 long-eared owl (*Asio otus*), 1 ruddy shelduck (*Tadorna ferruginea*) , 1 dog (*Canis familiaris*), 1 black-crowned night-heron (*Nycticorax nycticorax*), 1 duck (*Unknown Species*), 1 African crake (*Crecopsis egregia*) and 1 yellow-legged gull (*Larus michahellis*).

Nasopharyngeal or oropharyngeal swabs (n = 175), and serum samples (n = 167) were taken from most of these animals during the period April 2024 to July 2024. Samples were collected using DeltaSwab Virus-3 ml contained in viral transport media (VTM) (Deltalab, S.L., Catalunya, Spain). At least one type of sample for each animal was obtained. Likewise, blood samples were also collected using Gel and Clot activator tubes (Vacutest Kima, S.r.l, Arzergrande, Italy) for subsequent serum extraction, 8 ml of blood was collected by jugular puncture from the slaughter animals and 1 ml of blood per animal from the other groups.

Such sampling was performed by veterinarians from Matadero Insular de Gran Canaria (Las Palmas de Gran Canaria, Gran Canaria, Spain) (1), Centro de Control Reproductivo Animal y Formación (CCRAF) from Albergue Insular de Animales de Gran Canaria (Arucas, Gran Canaria, Spain) (2), Centro Insular de Recuperación de Fauna Silvestre de Tafira (Las Palmas de Gran Canaria, Gran Canaria, Spain) (3) and Centro Clínico Veterinario La Plaza (Villa de Ingenio, Gran Canaria, Spain) (4). Samples from wildlife cats were obtained from veterinary clinics having permissions to work with these populations from the corresponding municipalities. Pets were classified according to a questionnaire filled by the owners, emphasizing whether they had contact or not with a COVID-19-affected human. In addition, the following data were recorded when possible: breed, age and clinical signs (respiratory and digestive) if any.

All samples were obtained from veterinary clinicians using conventional sampling protocols in accordance with the guidelines outlined by the European Commission (2010/63/EU) and Spanish Legislation (Law 53/2013) for the protection of animals in

scientific research. Owners/keepers were duly informed regarding the purpose of the study, the data protection policy and granted their consent for each pet.

4.2. RNA extraction and detection of SARS-CoV-2 by RT-qPCR

A total of 175 out of 177 animals were tested for the detection of SARS-CoV-2 RNA: 50 cattle (*Bos taurus*), 41 small ruminants (22 caprine, *Capra aegagrus hircus*, and 18 ovine, *Ovis orientalis aries*), 30 pig (*Suis domesticus*), 30 rabbits (*Oryctolagus cuniculus*), 8 cats (*Felis catus*, 7 colony cats, 1 pet cats), 8 North African hedgehog (*Atelerix algirus*), 3 Scopoli's shearwater (*Calonectris diomedea*), 1 ruddy shelduck (*Tadorna ferruginea*) , 1 dog (*Canis familiaris*), 1 black-crowned night-heron (*Nycticorax nycticorax*), 1 duck (*Unknown Species*), 1 African crake (*Crecopsis egregia*) and 1 yellow-legged gull (*Larus michahellis*).

Sterile dry oral/nasal swabs were transferred into DeltaSwab Virus-3 ml contained in viral transport media (VTM) (Deltalab, S.L., Catalunya, Spain). The DeltaSwabs Virus with viral transport medium was directly vortexed and the contents are poured into a small tube for better handling, 1 ml is poured into a Cobas® PCR Media tube containing ≤ 40% (w/w) Guanidine hydrochloride Tris-HCl buffer (Cobas S.L, Madrid, Spain). RNA was extracted using STARMag 96x4 Viral DNA/RNA kit (Seegene Inc, Seoul, South Korea) according to the manufacturer's protocols. Briefly, 400 µL of each sample was extracted and eluted using 50 µL of elution buffer. Reverse transcription-quantitative polymerase chain reaction (RT-qPCR) was done using Allplex SARS-CoV-2/FluA/FluB/RSV Assay (Seegene Inc, Seoul, South Korea) on a Bio-Rad CFX96 instrument (Bio-Rad Laboratories, Hercules, USA). This multiplex assay can simultaneously detect SARS-CoV-2 (N gene, RdRP gene and S gene), influenza A, influenza B and Respiratory Sicitial Virus (RSV). Five microliters of extracted RNA was added to 15 µL of mastermix for each reaction, and amplification was performed at 50°C for 20 min, 95°C for 15 min, 2 cycles of 95°C for 10 s, 60°C for 40 s, 72°C for 20 s, 41 cycles of 95°C for 10 s followed by fluorescence detection at 60°C for 15 s and 72°C for 10 s. All runs were performed together with relevant controls to ensure validity. The results were exported to Microsoft Excel (Office 365) and interpreted using Seegene Viewer (Seegene Inc, Seoul, South Korea). The results were interpreted based on the cycle threshold (Ct), with samples presenting Cq ≤ 40 considered positive (Choi et al., 2022; Chung et al., 2024; Estofolete et al., 2023; Ruttoh et al., 2023).

4.3. Neutralization assay of SARS-CoV-2

A total of 167 out of 177 animals were tested for the detection of SARS-CoV-2 RNA (Annex II): 48 cattle (*Bos taurus*), 41 small ruminants (22 caprine, *Capra aegagrus hircus*, and 18 ovine, *Ovis orientalis aries*), 30 pig (*Suis domesticus*), 30 rabbits (*Oryctolagus cuniculus*), 8 cats (*Felis catus*, 7 stray cats, 1 pet cats), 5 North African hedgehog (*Atelerix algirus*), 2 Scopoli's shearwater (*Calonectris diomedea*), 1 ruddy shelduck (*Tadorna ferruginea*), 1 dog (*Canis familiaris*), 1 black-crowned night-heron (*Nycticorax nycticorax*), and 1 yellow-legged gull (*Larus michahellis*).

The blood samples were centrifuged at 3.000 rpm during 10 minutes, when serum is differentiated from blood plasma it is sent to analyze.

The antibody testing was performed with a commercially available immunoassays: the SARS-CoV-2 IgG (manufactured by Abbott, Sligo, Ireland). The Abbott assay detects the presence of the anti-nucleocapsid (N) SARS-CoV-2 IgG antibodies, which are induced after SARS-CoV-2 contact, but not after mRNA vaccine inoculation. Serum samples were aliquoted and frozen (−20 °C) and then tested with the Abbott assay. Laboratory processes were performed according to the manufacturers' instructions. The Abbott chemiluminescent microparticle immunoassay (CMIA) detects IgG antibodies against the SARS-CoV-2 nucleocapsid. The results are expressed as indices, calculated as a ratio of sample and calibrator signals. The cut-off for positive result is 1.4. The testing was run on an Abbott Architect i2000sr analyzer (Abbott, Sligo, Ireland) (Narasimhan et al., 2021; Swadźba et al., 2024)

5. RESULTS

After the processing of the samples and their subsequent analysis in the microbiology laboratory of the Hospital Universitario de Gran Canaria Dr. Negrin (HUGCDN), the result obtained for the 167 blood serum samples analyzed was negative to SARS-COV-2, while the 175 samples analyzed by PCR of nasal swabs were also negative to SARS-COV-2 in their entirety. This is shown in Annexes I and II, where we can see the origin, the date of sampling and the species of the samples.

6. DISCUSSION

As COVID-19 spread in many regions of the world, a different transmission dynamic has been postulated; human-to-animal transmission (Goraichuk et al., 2021). This is because

SARS-CoV-2 has been detected in dogs and cats in households with confirmed human cases of COVID-19 in Argentina, Brazil, China, Spain and the United States (Yang et al., 2019; Sit et al., 2020; Fuentealba et al., 2021; Calvet et al., 2021; Meisner et al., 2022). It has also been detected in mink in Denmark, the Netherlands and the USA (Eckstrand et al., 2021; Larsen et al., 2021; Oude Munnink et al., 2021; Pomorska-Mól et al., 2021) in white-tailed deer in the USA (Chandler et al., 2021) and in cougars and lions in South Africa and the USA (Koeppel et al., 2022).

This study is the first one being conducted in the Canary Islands for the epidemiological surveillance of SARS CoV-2 in animal populations. So far, we have not been able to find any serum samples indicating the presence of antibodies against SARS-CoV-2 in any of the animal groups studied so far. The literature consulted refers to a seroprevalence in cattle ranging between 1 and 3% in times of low incidence of human cases at European level (Hüttl et al., 2024). The emergence and worldwide spread of variants of concern (VOC) of SARS-CoV-2 has widened the range of susceptible host species. Previous experimental infection studies in cattle using SARS-CoV-2 isolates similar to those from Wuhan suggested that cattle were unlikely to be amplifying hosts for SARS-CoV-2. However, SARS-CoV-2 seropositive and RNA-positive cattle have since been identified in Europe, India and Africa. These findings suggest that cattle are more permissive to infection with the Delta variant of SARS-CoV-2 than the Omicron BA.2 and Wuhan-like isolates, but, in the absence of horizontal transmission, they are unlikely to be reservoir hosts for currently circulating SARS-CoV-2 variants (which may be in agreement with our results if maintained with a higher N in the future (Cool et al., 2024).

For pigs, studies have determined the prevalence of neutralizing antibodies to SARS-CoV-2 in wild pigs during 2018 (pre-pandemic period) and March 2020 to February 2021 (pandemic period) in Travis County, Texas. The results indicated that SARS-CoV-2 infection of wild pigs occurred in early 2021 in Travis County, Texas, but no serological evidence of SARS-CoV-2 infection was detected in wild pig samples collected from the same locality and during the same period (Palermo et al., 2023).

On the other side, there are recent studies in which a collection of sera from farm animals, wild boar and pre- and post-pandemic human sera, including human sera capable of neutralizing SARS-CoV-2 in vitro, were tested in serological tests for cross-reactivity with β- and α-CoV originating from farm animals. The sera were tested in neutralization

assays with high ascending concentrations of β-CoV bovine coronavirus (BCV), SARS-CoV-2 and porcine transmissible gastroenteritis virus α-CoV (TGEV). In addition, the sera were tested for immunostaining of cells infected with β-CoV porcine hemagglutinating encephalomyelitis (PHEV). The tests revealed a significantly higher percentage of BCV neutralization (78 %) for sera from humans who had experienced a SARS-CoV-2 infection (SARS-CoV-2 convalescent sera) than that observed for pre-pandemic human sera (37 %). Furthermore, 46% of these human SARS-CoV-2 convalescent sera neutralized the highest BCV concentration tested, while only 9.6% of the pre-pandemic sera did so. Largely similar percentages were observed for staining of PHEV-infected cells by these panels of human sera. In addition, post-pandemic sera collected from wild boar living near a densely populated area in the Netherlands also showed a higher percentage (43%) and stronger BCV neutralization than that observed for pre-pandemic sera from this area (21%) and for pre-pandemic (28%) and post-pandemic (20%) collected from wild boar living in a nature reserve park with limited access to the public. High percentages of BCV neutralization were observed for pre-pandemic and post-pandemic sera from cows (100%), pigs (up to 45%), sheep (36%) and rabbits (60%).

However, this cross-neutralization was limited to sera collected from specific herds or farms. TGEV was neutralized only by pig sera (68%) and some wild boar sera (4.6%). None of the pre-pandemic human, wild boar and farm animal sera cross-reacting with BCV and PHEV effectively neutralized SARS-CoV-2 in vitro. Pre-existing antibodies in human sera effectively neutralized animal β-CoV in vitro. This cross-neutralization was enhanced after humans experienced SARS-CoV-2 infection, indicating that SARS-CoV-2 activated a "memory" antibody response against structurally related epitopes expressed on the surface of a wide range of heterologous CoV, including β-CoV isolated from farm animals (Hulst et al., 2024).

On the other side, since SARS-CoV-2 caused the COVID-19 pandemic, records have suggested the occurrence of reverse zoonosis from pets and farm animals in contact with SARS-CoV-2-positive humans in the West. However, there is little information on the spread of the virus among animals in contact with humans in Africa. In this regard, there is recent work assessing the seroprevalence and presence of the virus by PCR in various animal species. SARS-CoV-2 RNA was detected in almost all animal taxa and sampling

sites. SARS-CoV-2 IgG was detected only in goats and pigs in some states. In general, SARS-CoV-2 infectivity rates were higher in 2021 than in 2022. However, the percentages of animals positive by SARS-CoV-2 PCR techniques were quite high at around 50% in sheep, goats, ducks or pigs and 100% in cats (Happi et al., 2023).

Ultimately, severe acute respiratory syndrome coronavirus-2 (SARS-CoV-2), which causes coronavirus disease 2019 (COVID-19), probably has evolutionary origins in animals other than humans, based on genetically related viruses that exist in rhinolophid bats and pangolins. Like other animal coronaviruses, SARS-CoV-2 contains a functional furin cleavage site in its spicule protein, which may broaden the host range of SARS-CoV-2 and affect pathogenesis. It is not yet clear whether ongoing zoonotic infections are possible in addition to efficient human-to-human transmission. On the contrary, human-to-animal transmission may occur according to the evidence provided in natural and experimental settings. Carnivores, including domestic cats, ferrets and mink, appear to be particularly susceptible to SARS-CoV-2 in contrast to poultry and other animals raised as livestock, such as cattle and pigs. Epidemiological evidence supported by genomic sequencing corroborated transmission events from mink to humans in agricultural settings. Aero-transmission of SARS-CoV-2 between experimentally infected cats further corroborates the possibility of cat-to-human transmission. To assess the risk of COVID-19 posed by domestic and farm carnivores, experimental evaluations should include surveillance and health assessment of domestic and farm carnivores, characterization of the immunological interaction between SARS-CoV-2 and carnivore coronaviruses, determination of the host range of SARS-CoV-2 beyond carnivores, and identification of human risk groups, such as veterinarians and agricultural workers. Strategies may need to be developed to mitigate the risk of zoonotic SARS-CoV-2 infections in a One Health framework and non-pharmaceutical interventions may need to consider free-roaming animals and the livestock industry (Jo et al., 2021).

On the other side, the epidemiological situation in Gran Canaria, where the first samples have been collected, must be considered to discuss our results. Between April and June 2024, the incidence of SARS CoV-e in the population of the island was practically negligible, and no epidemiological data were found by the Health Department of the Government of the Canary Islands. On the contrary, an increase in the number of human cases of SARS-COV-2 is currently being observed and will apparently increase over time.

This will lead to an increase in SARS-COV-2 positive cases in animals in line with human cases, mainly in companion animals or food animals in direct contact with humans (Castillo et al., 2024; Gaudreault et al., 2022; Oude Munnink et al., 2021).

In this sense, this study is only a small, first step in a larger study in terms of number of samples, animal species and geographical extension in the Canary Islands, which is currently being carried out and which in the next two years will have the results that will allow us to obtain a picture of the prevalence of this virus in possible animal hosts in our geographical environment.

7. CONCLUSIONS:

1.- The seroprevalence against SARS CoV-2 nucleocapsid, as well as the presence of this virus by RT-PCR technique has been 0% in blood and nasopharyngeal swab samples from farm animals, colony cats, pets and wildlife obtained during the low incidence phase of COVID-19 in humans in Gran Canaria.

2.- Future studies are needed to shed light on the role of SARS-CoV-2 positive animals in ongoing virus maintenance and transmission to humans and between animals in the Canary Islands. Continuous monitoring of the virus in animals and humans is recommended, as well as temporal correlation of positivity rates, in order to be prepared in case of mutations that may increase the virulence and transmissibility of the virus as it moves from one species to another.

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9. BIBLIOGRAPHY

Álvarez-Díaz, D. A., Laiton-Donato, K., Franco-Muñoz, C., & Mercado-Reyes, M. (2020). SARS-CoV-2 sequencing: The technological initiative to strengthen early warning systems for public health emergencies in Latin America and the Caribbean. *Biomedica*, *40*(2), 1–10. doi: 10.7705/BIOMEDICA.5841

Calvet, G. A., Pereira, S. A., Ogrzewalska, M., Pauvolid-Corrêa, A., Resende, P. C., Tassinari, W. de S., de Pina Costa, A., Keidel, L. O., da Rocha, A. S. B., da Silva, M. F. B., dos Santos, S. A., Lima, A. B. M., de Moraes, I. C. V., Mendes, A. A. V., Souza, T. das C., Martins, E. B., Ornellas, R. O., Corrêa, M. L., Antonio, I. M. da S., … Menezes, R. C. (2021). Investigation of SARS-CoV-2 infection in dogs and cats of humans diagnosed with COVID-19 in Rio de Janeiro, Brazil. *PLoS ONE*, *16*(4 April 2021). doi: 10.1371/journal.pone.0250853

Castillo, A. P., Miranda, J. V. O., Fonseca, P. L. C., Silva, S. de O., Lopes, R. E. N., Spanhol, V. C., Moreira, R. G., Nicolino, R. R., Queiroz, D. C., de Araújo e Santos, L. C. G., dos Santos, A. P. S., Rivetti, H. A. A., Martins-Duarte, E. S., de Almeida Vitor, R. W., dos Reis, J. K. P., Aguiar, R. S., & da Silveira, J. A. G. (2024). Evidence of SARS-CoV-2 infection and co-infections in stray cats in Brazil. *Acta Tropica*, *249*. doi: 10.1016/j.actatropica.2023.107056

Chaintoutis, S. C., Thomou, Z., Mouchtaropoulou, E., Tsiolas, G., Chassalevris, T., Stylianaki, I., Lagou, M., Michailidou, S., Moutou, E., Koenen, J. J. H., Dijkshoorn, J. W., Paraskevis, D., Poutahidis, T., Siarkou, V. I., Sypsa, V., Argiriou, A., Fortomaris, P., & Dovas, C. I. (2021). Outbreaks of SARS-CoV-2 in naturally infected mink farms: Impact, transmission dynamics, genetic patterns, and environmental contamination. *PLoS Pathogens*, *17*(9). doi: 10.1371/journal.ppat.1009883

Chandler, J. C., Bevins, S. N., Ellis, J. W., Linder, T. J., Tell, R. M., Jenkins-Moore, M., Root, J. J., Lenoch, J. B., Robbe-Austerman, S., Deliberto, T. J., Gidlewski, T., Kim Torchetti, M., & Shriner, S. A. (2021). *SARS-CoV-2 exposure in wild white-tailed deer (Odocoileus virginianus)*. doi: 10.1073/pnas.2114828118/-/DCSupplemental

Choi, S. J., Jung, J., Kim, E. S., Kim, H. Bin, Park, J. S., Park, K. U., Lee, H., Lee, E., Choe, P. G., Kim, J. Y., Lee, E. J., & Song, K. H. (2022). Diagnostic Performance, Stability, and Usability of Self-Collected Combo Swabs and Saliva for Coronavirus Disease 2019 Diagnosis: A Case-Control Study. *Infection and Chemotherapy*, *54*(3), 517–528. doi: 10.3947/IC.2022.0081

Chung, P. Y. J., Dhillon, S. K., Simoens, C., Cuypers, L., Laenen, L., Bonde, J., Corbisier, P., Buttinger, G., Cocuzza, C. E., Van Gucht, S., Van Ranst, M., & Arbyn, M. (2024). Assessment of the clinical and analytical performance of three Seegene Allplex SARS-CoV-2 assays within the VALCOR framework. *Microbiology Spectrum*, *12*(2). doi: 10.1128/spectrum.02397-23

Cool, K., Gaudreault, N. N., Trujillo, J. D., Morozov, I., McDowell, C. D., Bold, D., Kwon, T., Balaraman, V., Assato, P., Madden, D. W., Mantlo, E., Souza-Neto, J., Matias-Ferreyra, F., Retallick, J., Singh, G., Schotsaert, M., Carossino, M., Balasuriya, U. B. R., Wilson, W. C., … Richt, J. A. (2024). Experimental co-infection of calves with SARS-CoV-2 Delta and Omicron variants of concern. *Emerging Microbes and Infections*, *13*(1). doi: 10.1080/22221751.2023.2281356

Delahay, R. J., de la Fuente, J., Smith, G. C., Sharun, K., Snary, E. L., Flores Girón, L., Nziza, J., Fooks, A. R., Brookes, S. M., Lean, F. Z. X., Breed, A. C., & Gortazar, C. (2021). Assessing the risks of SARS-CoV-2 in wildlife. *One Health Outlook*, *3*(1). doi: 10.1186/s42522-021-00039-6

Eckstrand, C. D., Baldwin, T. J., Rood, K. A., Clayton, M. J., Lott, J. K., Wolking, R. M., Bradway, D. S., & Baszler, T. (2021). An outbreak of SARS-CoV-2 with high mortality in mink (Neovison vison) on multiple Utah farms. *PLoS Pathogens*, *17*(11). doi: 10.1371/journal.ppat.1009952

Estofolete, C. F., Banho, C. A., Verro, A. T., Gandolfi, F. A., dos Santos, B. F., Sacchetto, L., Marques, B. de C., Vasilakis, N., & Nogueira, M. L. (2023). Clinical Characterization of Respiratory Syncytial Virus Infection in Adults: A Neglected Disease? *Viruses*, *15*(9). doi: 10.3390/v15091848

Fenollar, F., Mediannikov, O., Maurin, M., Devaux, C., Colson, P., Levasseur, A., Fournier, P. E., & Raoult, D. (2021). Mink, SARS-CoV-2, and the Human-Animal Interface. In Frontiers in Microbiology (Vol. 12). Frontiers Media S.A. doi: 10.3389/fmicb.2021.663815

Fuentealba, N. A., Moré, G., Bravi, M. E., Unzaga, J. M., De Felice, L., Salina, M., Viegas, M., Nabaes Jodar, M. S., Valinotto, L. E., Rivero, F. D., Di Lullo, D., Pecoraro, M., & Panei, C. J. (2021). First detection and molecular analysis of SARS-CoV-2 from a naturally infected cat from Argentina. *Veterinary Microbiology*, *260*. doi: 10.1016/j.vetmic.2021.109179

Gaudreault, N. N., Cool, K., Trujillo, J. D., Morozov, I., Meekins, D. A., McDowell, C., Bold, D., Carossino, M., Balaraman, V., Mitzel, D., Kwon, T., Madden, D. W., Artiaga, B. L., Pogranichniy, R. M., Roman-Sosa, G., Wilson, W. C., Balasuriya, U. B. R., García-Sastre, A., & Richt, J. A. (2022). Susceptibility of sheep to experimental co-infection with the ancestral lineage of SARS-CoV-2 and its alpha variant. *Emerging Microbes and Infections*, *11*(1), 662–675. doi: 10.1080/22221751.2022.2037397

Gaudreault, N. N., Trujillo, J. D., Carossino, M., Meekins, D. A., Morozov, I., Madden, D. W., Indran, S. V., Bold, D., Balaraman, V., Kwon, T., Artiaga, B. L., Cool, K., García-Sastre, A., Ma, W., Wilson, W. C., Henningson, J., Balasuriya, U. B. R., & Richt, J. A. (2020). SARS-CoV-2 infection, disease and transmission in domestic cats. *Emerging Microbes and Infections*, *9*(1), 2322–2332. doi: 10.1080/22221751.2020.1833687

Goraichuk, I. V., Arefiev, V., Stegniy, B. T., & Gerilovych, A. P. (2021). Zoonotic and Reverse Zoonotic Transmissibility of SARS-CoV-2. In Virus Research (Vol. 302). Elsevier B.V. doi: 10.1016/j.virusres.2021.198473

Happi, A. N., Ayinla, A. O., Ogunsanya, O. A., Sijuwola, A. E., Saibu, F. M., Akano, K., George, U. E., Sopeju, A. E., Rabinowitz, P. M., Ojo, K. K., Barrett, L. K., Van Voorhis, W. C., & Happi, C. T. (2023). Detection of SARS-CoV-2 in Terrestrial Animals in Southern Nigeria: Potential Cases of Reverse Zoonosis. *Viruses*, *15*(5). doi: 10.3390/v15051187

Hu, B., Ge, X., Wang, L. F., & Shi, Z. (2015). Bat origin of human coronaviruses Coronaviruses: Emerging and re-emerging pathogens in humans and animals Susanna Lau Positive-strand RNA viruses. In Virology Journal (Vol. 12, Issue 1). BioMed Central Ltd. doi: 10.1186/s12985-015-0422-1

Hulst, M., Kant, A., Harders-Westerveen, J., Hoffmann, M., Xie, Y., Laheij, C., Murk, J. L., & Van der Poel, W. H. M. (2024). Cross-Reactivity of Human, Wild Boar, and Farm Animal Sera from Pre- and Post-Pandemic Periods with Alpha- and Beta-Coronaviruses (CoV), including SARS-CoV-2. *Viruses*, *16*(1). doi: 10.3390/v16010034

Hüttl, J., Reitt, K., Meli, M. L., Meili, T., Bönzli, E., Pineroli, B., Ginders, J., Schoster, A., Jones, S., Tyson, G. B., Hosie, M. J., Pusterla, N., Wernike, K., & Hofmann-Lehmann, R. (2024). Serological and Molecular Investigation of SARS-CoV-2 in Horses and Cattle in Switzerland from 2020 to 2022. *Viruses*, *16*(2). doi: 10.3390/v16020224

Islam, A., Ferdous, J., Islam, S., Sayeed, M. A., Rahman, M. K., Saha, O., Hassan, M. M., & Shirin, T. (2022). Transmission dynamics and susceptibility patterns of SARS-CoV-2 in domestic, farmed and wild animals: Sustainable One Health surveillance for conservation and public health to prevent future epidemics and pandemics. In Transboundary and Emerging Diseases (Vol. 69, Issue 5, pp. 2523–2543). John Wiley and Sons Inc. doi: 10.1111/tbed.14356

Jo, W. K., de Oliveira-Filho, E. F., Rasche, A., Greenwood, A. D., Osterrieder, K., & Drexler, J. F. (2021). Potential zoonotic sources of SARS-CoV-2 infections. In Transboundary and Emerging Diseases (Vol. 68, Issue 4, pp. 1824–1834). John Wiley and Sons Inc. doi: 10.1111/tbed.13872

Koeppel, K. N., Mendes, A., Strydom, A., Rotherham, L., Mulumba, M., & Venter, M. (2022). SARS-CoV-2 Reverse Zoonoses to Pumas and Lions, South Africa. *Viruses*, *14*(1). doi: 10.3390/v14010120

Larsen, H. D., Fonager, J., Lomholt, F. K., Dalby, T., Benedetti, G., Kristensen, B., Urth, T. R., Rasmussen, M., Lassaunière, R., Rasmussen, T. B., Strandbygaard, B., Lohse, L., Chaine, M., Møller, K. L., Berthelsen, A. S. N., Nørgaard, S. K., Sönksen, U. W., Boklund, A. E., Hammer, A. S., … Mølbak, K. (2021). Preliminary report of an outbreak of SARS-CoV-2 in mink and mink farmers associated with community spread, Denmark, June to November 2020. In Eurosurveillance (Vol. 26, Issue 5). European Centre for Disease Prevention and Control (ECDC). doi: 10.2807/1560-7917.ES.2021.26.5.210009

Meisner, J., Baszler, T. V., Kuehl, K. E., Ramirez, V., Baines, A., Frisbie, L. A., Lofgren, E. T., de Avila, D. M., Wolking, R. M., Bradway, D. S., Wilson, H. R., Lipton, B., Kawakami, V., & Rabinowitz, P. M. (2022). Household Transmission of SARS-CoV-2 from Humans to Pets, Washington and Idaho, USA. *Emerging Infectious Diseases*, *28*(12), 2425–2434. doi: 10.3201/eid2812.220215

Narasimhan, M., Mahimainathan, L., Araj, E., Clark, A. E., Markantonis, J., Green, A., Xu, J., Sorelle, J. A., Alexis, C., Fankhauser, K., Parikh, H., Wilkinson, K., Reczek, A., Kopplin, N., Yekkaluri, S., Balani, J., Thomas, A., Singal, A. G., Sarode, R., & Muthukumar, A. (2021). *Clinical Evaluation of the Abbott Alinity SARS-CoV-2 Spike-Specific Quantitative IgG and IgM Assays among Infected, Recovered, and Vaccinated Groups*. Retrieved from https://journals.asm.org/journal/jcm

Oude Munnink, B. B., Sikkema, R. S., Nieuwenhuijse, D. F., Molenaar, R. J., Munger, E., Molenkamp, R., Van Der Spek, A., Tolsma, P., Rietveld, A., Brouwer, M., Bouwmeester-Vincken, N., Harders, F., Hakze-Van Der Honing, R., Wegdam-Blans, M. C. A., Bouwstra, R. J., Geurtsvankessel, C., Van Der Eijk, A. A., Velkers, F. C., Smit, L. A. M., … Koopmans, M. P. G. (2021). *Transmission of SARS-CoV-2 on mink farms between humans and mink and back to humans*. doi: 10.1126/science.abe5901

Palermo, P. M., Orbegozo, J., Watts, D. M., & Morrill, J. C. (2023). Serosurveillance for Severe Acute Respiratory Syndrome Coronavirus 2 Antibody in Feral Swine and White-Tailed Deer in Texas. *Vector-Borne and Zoonotic Diseases*, *23*(7), 397–400. doi: 10.1089/vbz.2023.0006

Pomorska-Mól, M., Włodarek, J., Gogulski, M., & Rybska, M. (2021). Review: SARS-CoV-2 infection in farmed minks – an overview of current knowledge on occurrence, disease and epidemiology. In Animal (Vol. 15, Issue 7). Elsevier B.V. doi: 10.1016/j.animal.2021.100272

Ramanujam, H., & Palaniyandi, K. (2022). COVID-19 in animals: A need for One Health approach. In Indian Journal of Medical Microbiology (Vol. 40, Issue 4, pp. 485–491). Indian Association of Medical Microbiologists. doi: 10.1016/j.ijmmb.2022.07.005

Red Nacional de Vigilancia Epidemiológica. (2023). *Protocolo para la vigilancia centinela de infección respiratoria aguda grave (IRAG) en España Protocolo para la vigilancia centinela de infección respiratoria aguda grave (IRAG) en hospitales*. Retrieved from https://www.ecdc.europa.eu/en/publications-data/rapid-risk-assessment-

Ruttoh, V. K., Symekher, S. L., Majanja, J. M., Opanda, S. M., Chitechi, E. W., Wadegu, M., Tonui, R., Rotich, P. K., Nyandwaro, T. T., Mwangi, A. W., Mwangi, I. N., Oira, R. M., Musimbi, A. G., & Nzou, S. M. (2023). Tracking severe acute respiratory syndrome coronavirus 2 transmission and co-infection with other acute respiratory pathogens using a sentinel surveillance system in Rift Valley, Kenya. *Influenza and Other Respiratory Viruses*, *17*(11). doi: 10.1111/irv.13227

Shang, J., Wan, Y., Luo, C., Ye, G., Geng, Q., Auerbach, A., & Li, F. (n.d.). *Cell entry mechanisms of SARS-CoV-2*. doi: 10.1073/pnas.2003138117/-/DCSupplemental

Shi, J., Wen, Z., Zhong, G., Yang, H., Wang, C., Huang, B., Liu, R., He, X., Shuai, L., Sun, Z., Zhao, Y., Liu, P., Liang, L., Cui, P., Wang, J., Zhang, X., Guan, Y., Tan, W., Wu, G., … Bu, Z. (2020). *Susceptibility of ferrets, cats, dogs, and other domesticated animals to SARS-coronavirus 2*.

Sit, T. H. C., Brackman, C. J., Ip, S. M., Tam, K. W. S., Law, P. Y. T., To, E. M. W., Yu, V. Y. T., Sims, L. D., Tsang, D. N. C., Chu, D. K. W., Perera, R. A. P. M., Poon, L. L. M., & Peiris, M. (2020). Infection of dogs with SARS-CoV-2. *Nature*, *586*(7831), 776–778. doi: 10.1038/s41586-020-2334-5

Swadźba, J., Panek, A., Wąsowicz, P., Anyszek, T., & Martin, E. (2024). High Concentration of Anti-SARS-CoV-2 Antibodies 2 Years after COVID-19 Vaccination Stems Not Only from Boosters but Also from Widespread, Often Unrecognized, Contact with the Virus. *Vaccines*, *12*(5). doi: 10.3390/vaccines12050471

Wu, D., Wu, T., Liu, Q., & Yang, Z. (2020). The SARS-CoV-2 outbreak: What we know. In International Journal of Infectious Diseases (Vol. 94, pp. 44–48). Elsevier B.V. doi: 10.1016/j.ijid.2020.03.004

Yang, S., Corbera, J. A., & Álvarez-García, G. (2019). *A comparative study of eight serological methods shows that spike protein-based ELISAs are the most accurate tests for serodiagnosing SARS-CoV-2 infections in cats and dogs*. Retrieved from https://www.ine.es/covid/covid_

Zhang, Y. Z., & Holmes, E. C. (2020). A Genomic Perspective on the Origin and Emergence of SARS-CoV-2. In Cell (Vol. 181, Issue 2, pp. 223–227). Cell Press. doi: 10.1016/j.cell.2020.03.035

Zhao, J., Kang, M., Wu, H., Sun, B., Baele, G., He, W. T., Lu, M., Suchard, M. A., Ji, X., He, N., Su, S., & Veit, M. (2024). Risk assessment of SARS-CoV-2 replicating and evolving in animals. In Trends in Microbiology (Vol. 32, Issue 1, pp. 79–92). Elsevier Ltd. doi: 10.1016/j.tim.2023.07.002

10. ANNEX

Table Annex I. Serological results.

ID	Analysis date	Surname	OMS - - ABU/ml	Units/ml	SARS CoV 2, IgG front of the quantifie d spicule	Sampling date	Origin reference	GROUP	ISLAND	Municipality code	Location	Species	Observations
04403799	30/04/2024	IS	0.01	0.10	Negative	25/04/2024	0210/24	Fauna	GC	016	CIRFST	*L-Michelis*	
04403800	30/04/2024	IS	Insuficent sample	Insuficent sample	Insuficent sample	25/04/2024	0214/24	Fauna	GC	016	CIRFST	*Pardela Cenicienta*	
04403801	30/04/2024	IS	Insuficent sample	Insuficent sample	Insuficent sample	25/04/2024	0225/24	Fauna	GC	016	CIRFST	Duck	
04403802	30/04/2024	IS	0.38	2.70	Negative	24/04/2024	B-10	Livestock	GC	011	MIGC	Bovine	76 months
04403803	30/04/2024	IS	0.04	0.30	Negative	24/04/2024	B-9	Livestock	GC	011	MIGC	Bovine	87 months
04403804	30/04/2024	IS	0.13	0.90	Negative	24/04/2024	B-8	Livestock	GC	027	MIGC	Bovine	92 months
04403805	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	B-7	Livestock	GC	023	MIGC	Bovine	59 months
04403806	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	B-6	Livestock	GC	022	MIGC	Bovine	55 months
04403807	30/04/2024	IS	0.06	0.40	Negative	24/04/2024	B-5	Livestock	GC	02	MIGC	Bovine	11 months
04403808	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	B-4	Livestock	GC	013	MIGC	Bovine	14 months
04403809	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	B-3	Livestock	GC	011	MIGC	Bovine	10 months
04403810	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	CON-9	Livestock	GC	011	MIGC	Rabbit	
04403811	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	CON-8	Livestock	GC	011	MIGC	Rabbit	
04403812	30/04/2024	IS	0.13	0.90	Negative	24/04/2024	CON-6	Livestock	GC	011	MIGC	Rabbit	
04403813	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	CON-7	Livestock	GC	011	MIGC	Rabbit	
04403814	30/04/2024	IS	0.27	1.90	Negative	24/04/2024	CON-10	Livestock	GC	011	MIGC	Rabbit	
04403815	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	CON-5	Livestock	GC	032	MIGC	Rabbit	
04403816	30/04/2024	IS	0.10	0.70	Negative	24/04/2024	CON-4	Livestock	GC	032	MIGC	Rabbit	
04403817	30/04/2024	IS	0.10	0.70	Negative	24/04/2024	CON-3	Livestock	GC	032	MIGC	Rabbit	

04403818	30/04/2024	IS	0.07	0.50	Negative	24/04/2024	CON-2	Livestock	GC	032	MIGC	Rabbit	
04403819	30/04/2024	IS	0.07	0.50	Negative	24/04/2024	CON-1	Livestock	GC	032	MIGC	Rabbit	
04403820	30/04/2024	IS	0.01	0.10	Negative	24/04/2024	B-2	Livestock	GC	02	MIGC	Bovine	70 months
04403821	30/04/2024	IS	0.00	0.00	Negative	24/04/2024	B-1	Livestock	GC	016	MIGC	Bovine	12 months
04403822	30/04/2024	IS	0.04	0.30	Negative	23/04/2024	PO-10	Livestock	GC	02	MIGC	Porcine	
04403823	30/04/2024	IS	0.00	0.00	Negative	23/04/2024	PO-9	Livestock	GC	027	MIGC	Porcine	
04403824	30/04/2024	IS	0.07	0.50	Negative	23/04/2024	PO-8	Livestock	GC	019	MIGC	Porcine	
04403825	30/04/2024	IS	0.01	0.10	Negative	23/04/2024	PO-7	Livestock	GC	019	MIGC	Porcine	
04403826	30/04/2024	IS	0.10	0.70	Negative	23/04/2024	PO-6	Livestock	GC	026	MIGC	Porcine	
04403827	30/04/2024	IS	0.03	0.20	Negative	23/04/2024	PO-1	Livestock	GC	026	MIGC	Porcine	
04403828	30/04/2024	IS	0.17	1.20	Negative	23/04/2024	PO-5	Livestock	GC	026	MIGC	Porcine	
04403829	30/04/2024	IS	0.00	0.00	Negative	23/04/2024	PO-3	Livestock	GC	02	MIGC	Porcine	
04403830	30/04/2024	IS	0.00	0.00	Negative	23/04/2024	PO-4	Livestock	GC	02	MIGC	Porcine	
04403831	30/04/2024	IS	0.00	0.00	Negative	23/04/2024	PO-2	Livestock	GC	026	MIGC	Porcine	
04403832	30/04/2024	IS	8.12	57.20	Negative	24/04/2024	CAP-1	Livestock	GC	011	MIGC	Caprine	
04403833	30/04/2024	IS	0.17	1.20	Negative	24/04/2024	CAP-2	Livestock	GC	011	MIGC	Caprine	
04403834	30/04/2024	IS	0.03	0.20	Negative	25/04/2024	CAP-6	Livestock	GC	02	MIGC	Caprine	<12 months
04403835	02/05/2024	IS	0.07	0.50	Negative	24/04/2024	CAP-5	Livestock	GC	011	MIGC	Caprine	
04403836	02/05/2024	IS	0.14	1.00	Negative	25/04/2024	CAP-7	Livestock	GC	02	MIGC	Caprine	<12 months
04403837	02/05/2024	IS	0.14	1.00	Negative	25/04/2024	CAP-8	Livestock	GC	013	MIGC	Caprine	>12 months
04403838	02/05/2024	IS	0.26	1.80	Negative	25/04/2024	CAP-9	Livestock	GC	013	MIGC	Caprine	>12 months
04403839	02/05/2024	IS	0.13	0.90	Negative	25/04/2024	CAP-10	Livestock	GC	013	MIGC	Caprine	>12 months
04403840	02/05/2024	IS	0.00	0.00	Negative	24/04/2024	CAP-4	Livestock	GC	011	MIGC	Caprine	
04403841	02/05/2024	IS	0.17	1.20	Negative	24/04/2024	CAP-3	Livestock	GC	011	MIGC	Caprine	
04403842	02/05/2024	IS	0.00	0.00	Negative	25/04/2024	OV-9	Livestock	GC	032	MIGC	Ovine	>12 months
04403843	02/05/2024	IS	0.00	0.00	Negative	25/04/2024	OV-10	Livestock	GC	032	MIGC	Ovine	>12 months
04403844	02/05/2024	IS	0.00	0.00	Negative	18/06/2024	F1	Livestock	GC	032	MIGC	Ovine	<12 months
04403845	02/05/2024	IS	0.03	0.20	Negative	25/04/2024	OV-7	Livestock	GC	032	MIGC	Ovine	<12 months

04403846	02/05/2024	IS	0.00	0.00	Negative	25/04/2024	OV-6	Livestock	GC	022	MIGC	Ovine	<12 months
04403847	02/05/2024	IS	0.00	0.00	Negative	25/04/2024	OV-5	Livestock	GC	022	MIGC	Ovine	<12 months
04403848	02/05/2024	IS	0.18	1.30	Negative	25/04/2024	OV-4	Livestock	GC	022	MIGC	Ovine	<12 months
04403849	02/05/2024	IS	0.07	0.50	Negative	25/04/2024	OV-3	Livestock	GC	022	MIGC	Ovine	<12 months
04403850	02/05/2024	IS	0.03	0.20	Negative	24/04/2024	OV-2	Livestock	GC	09	MIGC	Ovine	
04403851	02/05/2024	IS	0.00	0.00	Negative	24/04/2024	OV-1	Livestock	GC	09	MIGC	Ovine	
04404522	06/06/2024	IS	0.00	0.00	Negative	15/05/2024	168/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404523	06/06/2024	IS	NO SAMPLE	NO SAMPLE	NO SAMPLE	15/05/2024	322/24	Fauna	GC	016	CIRFST	Martinete	
04404524	06/06/2024	IS	0.06	0.40	Negative	15/05/2024	326/24	Fauna	GC	016	CIRFST	Pardela Cenicienta	
04404525	06/06/2024	IS	0.00	0.00	Negative	15/05/2024	183/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404526	06/06/2024	IS	0.10	0.70	Negative	15/05/2024	228/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404527	02/05/2024	IS	NO SAMPLE	NO SAMPLE	NO SAMPLE	25/04/2024	228/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404528	02/05/2024	IS	NO SAMPLE	NO SAMPLE	NO SAMPLE	25/04/2024	Erizo Moruno	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404529	02/05/2024	IS	NO SAMPLE	NO SAMPLE	NO SAMPLE	25/04/2024	60/24	Fauna	GC	016	CIRFST	Guion Africano	
04404530	02/05/2024	IS	NO SAMPLE	NO SAMPLE	NO SAMPLE	25/04/2024	Búho Chico	Fauna	GC	016	CIRFST	Búho Chico	
04411201	13/05/2024	IS	0.07	0.50	Negative	02/05/2024	CON-1	Livestock	GC	032	MIGC	Rabbit	
04411202	07/05/2024	IS	0.10	0.70	Negative	02/05/2024	CON-2	Livestock	GC	032	MIGC	Rabbit	
04411203	07/05/2024	IS	0.10	0.70	Negative	02/05/2024	CON-3	Livestock	GC	032	MIGC	Rabbit	
04411204	07/05/2024	IS	0.00	0.00	Negative	02/05/2024	CON-4	Livestock	GC	032	MIGC	Rabbit	
04411205	07/05/2024	IS	0.20	1.40	Negative	02/05/2024	CON-5	Livestock	GC	032	MIGC	Rabbit	
04411206	07/05/2024	IS	0.00	0.00	Negative	02/05/2024	CON-6	Livestock	GC	011	MIGC	Rabbit	
04411207	07/05/2024	IS	0.04	0.30	Negative	02/05/2024	CON-7	Livestock	GC	011	MIGC	Rabbit	
04411208	07/05/2024	IS	0.03	0.20	Negative	02/05/2024	CON-8	Livestock	GC	011	MIGC	Rabbit	
04411209	07/05/2024	IS	0.13	0.90	Negative	02/05/2024	CON-9	Livestock	GC	011	MIGC	Rabbit	

04411210	07/05/2024	IS	0.17	1.20	Negative	02/05/2024	CON-10	Livestock	GC	011	MIGC	Rabbit	
04411211	07/05/2024	IS	0.07	0.50	Negative	29/04/2024	OV-1	Livestock	GC	031	MIGC	Ovine	>18 months
04411212	07/05/2024	IS	0.00	0.00	Negative	29/04/2024	OV-3	Livestock	GC	033	MIGC	Ovine	>18 months
04411213	07/05/2024	IS	0.04	0.30	Negative	02/05/2024	OV-9	Livestock	GC	09	MIGC	Ovine	>18 months
04411214	07/05/2024	IS	0.04	0.30	Negative	02/05/2024	OV-10	Livestock	GC	09	MIGC	Ovine	>18 months
04411215	07/05/2024	IS	0.00	0.00	Negative	29/04/2024	CAP-1	Livestock	GC	031	MIGC	Caprine	>18 months
04411216	07/05/2024	IS	0.00	0.00	Negative	29/04/2024	CAP-2	Livestock	GC	031	MIGC	Caprine	>18 months
04411217	07/05/2024	IS	0.00	0.00	Negative	29/04/2024	CAP-3	Livestock	GC	031	MIGC	Caprine	>18 months
04411218	07/05/2024	IS	0.13	0.90	Negative	02/05/2024	CAP-4	Livestock	GC	019	MIGC	Caprine	
04411219	07/05/2024	IS	0.00	0.00	Negative	02/05/2024	CAP-5	Livestock	GC	019	MIGC	Caprine	
04411220	07/05/2024	IS	0.09	0.60	Negative	02/05/2024	CAP-6	Livestock	GC	019	MIGC	Caprine	
04411221	07/05/2024	IS	0.07	0.50	Negative	02/05/2024	CAP-7	Livestock	GC	019	MIGC	Caprine	
04411222	07/05/2024	IS	0.00	0.00	Negative	30/04/2024	P1	Livestock	GC	02	MIGC	Porcine	Bait
04411223	07/05/2024	IS	0.00	0.00	Negative	30/04/2024	P2	Livestock	GC	25	MIGC	Porcine	Bait
04411224	07/05/2024	IS	0.09	0.60	Negative	30/04/2024	P3	Livestock	GC	025	MIGC	Porcine	Bait
04411225	07/05/2024	IS	0.00	0.00	Negative	30/04/2024	P4	Livestock	GC	027	MIGC	Porcine	Bait
04411226	07/05/2024	IS	0.00	0.00	Negative	30/04/2024	P5	Livestock	GC	026	MIGC	Porcine	Bait
04411227	07/05/2024	IS	0.41	2.90	Negative	30/04/2024	P6	Livestock	GC	026	MIGC	Porcine	Bait
04411228	07/05/2024	IS	0.01	0.10	Negative	30/04/2024	P7	Livestock	GC	026	MIGC	Porcine	Bait
04411229	07/05/2024	IS	0.00	0.00	Negative	30/04/2024	P8	Livestock	GC	026	MIGC	Porcine	Bait
04411230	07/05/2024	IS	0.00	0.00	Negative	30/04/2024	P9	Livestock	GC	02	MIGC	Porcine	Bait
04411231	07/05/2024	IS	0.17	1.20	Negative	30/04/2024	P10	Livestock	GC	02	MIGC	Porcine	Reproducer
04411232	07/05/2024	IS	0.00	0.00	Negative	29/04/2024	B1	Livestock	GC	02	MIGC	Bovine	15 months
04411233	07/05/2024	IS	0.17	1.20	Negative	29/04/2024	B2	Livestock	GC	02	MIGC	Bovine	12 months
04411234	07/05/2024	IS	0.00	0.00	Negative	29/04/2024	B3	Livestock	GC	022	MIGC	Bovine	14 months
04411235	07/05/2024	IS	0.13	0.90	Negative	02/05/2024	B4	Livestock	GC	026	MIGC	Bovine	12 months
04411236	07/05/2024	IS	1.01	7.10	Negative	02/05/2024	B5	Livestock	GC	02	MIGC	Bovine	12 months
04411237	07/05/2024	IS	0.04	0.30	Negative	02/05/2024	B6	Livestock	GC	026	MIGC	Bovine	12 months

04411238	07/05/2024	IS	0.13	0.90	Negative	02/05/2024	B7	Livestock	GC	02	MIGC	Bovine	11 months
04411239	07/05/2024	IS	0.00	0.00	Negative	02/05/2024	B8	Livestock	GC	02	MIGC	Bovine	11 months
04411240	07/05/2024	IS	0.00	0.00	Negative	02/05/2024	B9	Livestock	GC	022	MIGC	Bovine	12 months
04411241	07/05/2024	IS	0.20	1.40	Negative	02/05/2024	B10	Livestock	GC	022	MIGC	Bovine	12 months
04411242	07/05/2024	IS	0.06	0.40	Negative	02/05/2024	B11	Livestock	GC	022	MIGC	Bovine	12 months
04411243	07/05/2024	IS	0.00	0.00	Negative	02/05/2024	B12	Livestock	GC	022	MIGC	Bovine	11 months
04411244	07/05/2024	IS	0.00	0.00	Negative	03/05/2024	B13	Livestock	GC	013	MIGC	Bovine	55 months
04411245	07/05/2024	IS	0.00	0.00	Negative	03/05/2024	B14	Livestock	GC	021	MIGC	Bovine	20 months
04411246	07/05/2024	IS	0.10	0.70	Negative	03/05/2024	B15	Livestock	GC	032	MIGC	Bovine	14 months
04411247	07/05/2024	IS	0.01	0.10	Negative	03/05/2024	B16	Livestock	GC	023	MIGC	Bovine	15 months
04411248	07/05/2024	IS	0.11	0.80	Negative	03/05/2024	B17	Livestock	GC	020	MIGC	Bovine	13 months
04411249	07/05/2024	IS	NO SAMPLE	NO SAMPLE	NO SAMPLE	03/05/2024	B18	Livestock	GC	020	MIGC	Bovine	13 months
04411250	07/05/2024	IS	NO SAMPLE	NO SAMPLE	NO SAMPLE	03/05/2024	B19	Livestock	GC	20	MIGC	Bovine	13 months
04411253	07/06/2024	IS	0.14	1.00	Negative	05/06/2024	413/24	Fauna	GC	016	CIRFST	A. otus	
04411254	07/06/2024	IS	0.20	1.40	Negative	05/06/2024	319/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04411255	07/06/2024	IS	0.23	1.60	Negative	05/06/2024	362/24	Fauna	GC	016	CIRFST	Pardela Cenicienta	
04411256	20/06/2024	IS	NO SAMPLE	NO SAMPLE	NO SAMPLE	15/05/2024	293/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04411257	06/06/2024	IS	0.00	0.00	Negative	15/05/2024	293/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04411258	06/06/2024	IS	0.13	0.90	Negative	15/05/2024	264/24	Fauna	GC	016	CIRFST	*Tadorna ferruginea*	
04411259	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	B41	Livestock	GC	026	MIGC	Bovine	
04411260	06/06/2024	IS	0.17	1.20	Negative	10/05/2024	B-40	Livestock	GC	002	MIGC	Bovine	
04411261	06/06/2024	IS	0.11	0.80	Negative	10/05/2024	B-39	Livestock	GC	002	MIGC	Bovine	
04411262	06/06/2024	IS	0.23	1.60	Negative	10/05/2024	B-38	Livestock	GC	020	MIGC	Bovine	
04411263	06/06/2024	IS	0.51	3.60	Negative	10/05/2024	B-37	Livestock	GC	020	MIGC	Bovine	
04411264	06/06/2024	IS	0.45	3.20	Negative	10/05/2024	B-36	Livestock	GC	020	MIGC	Bovine	

04411265	06/06/2024	IS	0.17	1.20	Negative	10/05/2024	B-35	Livestock	GC	016	MIGC	Bovine	
04411266	06/06/2024	IS	0.11	0.80	Negative	10/05/2024	B-34	Livestock	GC	016	MIGC	Bovine	
04411267	06/06/2024	IS	0.11	0.80	Negative	10/05/2024	B-33	Livestock	GC	020	MIGC	Bovine	
04411268	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	B-32	Livestock	GC	022	MIGC	Bovine	
04411269	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	B-31	Livestock	GC	022	MIGC	Bovine	
04411270	06/06/2024	IS	0.13	0.90	Negative	10/05/2024	B-30	Livestock	GC	022	MIGC	Bovine	
04414344	06/06/2024	IS	0.13	0.90	Negative	10/05/2024	CON-21	Livestock	GC	013	MIGC	Rabbit	
04414345	06/06/2024	IS	0.11	0.80	Negative	10/05/2024	CON-22	Livestock	GC	021	MIGC	Rabbit	
04414346	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	CON-23	Livestock	GC	032	MIGC	Rabbit	
04414347	06/06/2024	IS	0.04	0.30	Negative	10/05/2024	CON-24	Livestock	GC	023	MIGC	Rabbit	
04414348	06/06/2024	IS	0.26	1.80	Negative	10/05/2024	CON-25	Livestock	GC	020	MIGC	Rabbit	
04414349	06/06/2024	IS	0.26	1.80	Negative	10/05/2024	CON-26	Livestock	GC	026	MIGC	Rabbit	
04414350	06/06/2024	IS	0.17	1.20	Negative	10/05/2024	CON-27	Livestock	GC	026	MIGC	Rabbit	
04414351	06/06/2024	IS	0.14	1.00	Negative	10/05/2024	CON-28	Livestock	GC	033	MIGC	Rabbit	
04414352	06/06/2024	IS	0.33	2.30	Negative	10/05/2024	CON-29	Livestock	GC	011	MIGC	Rabbit	
04414353	06/06/2024	IS	0.04	0.30	Negative	10/05/2024	CON-30	Livestock	GC	011	MIGC	Rabbit	
04414354	06/06/2024	IS	0.33	2.30	Negative	10/05/2024	P-21	Livestock	GC	025	MIGC	Porcine	
04414355	06/06/2024	IS	0.14	1.00	Negative	10/05/2024	P-22	Livestock	GC	025	MIGC	Porcine	
04414356	06/06/2024	IS	0.01	0.10	Negative	10/05/2024	P-23	Livestock	GC	026	MIGC	Porcine	
04414357	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	P-24	Livestock	GC	026	MIGC	Porcine	
04414358	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	P-25	Livestock	GC	002	MIGC	Porcine	
04414359	06/06/2024	IS	0.84	5.90	Negative	10/05/2024	P-26	Livestock	GC	002	MIGC	Porcine	
04414360	06/06/2024	IS	0.13	0.90	Negative	10/05/2024	P-27	Livestock	GC	002	MIGC	Porcine	
04414361	06/06/2024	IS	0.13	0.90	Negative	10/05/2024	P-28	Livestock	GC	026	MIGC	Porcine	
04414362	06/06/2024	IS	0.14	1.00	Negative	10/05/2024	P-29	Livestock	GC	002	MIGC	Porcine	
04414363	06/06/2024	IS	0.01	0.10	Negative	10/05/2024	P-30	Livestock	GC	002	MIGC	Porcine	
04414364	06/06/2024	IS	0.13	0.90	Negative	10/05/2024	B-21	Livestock	GC	020	MIGC	Bovine	
04414365	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	B-22	Livestock	GC	020	MIGC	Bovine	

04414366	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	B-23	Livestock	GC	020	MIGC	Bovine	
04414367	06/06/2024	IS	0.13	0.90	Negative	10/05/2024	B-24	Livestock	GC	016	MIGC	Bovine	
04414368	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	B-25	Livestock	GC	016	MIGC	Bovine	
04414369	06/06/2024	IS	0.14	1.00	Negative	10/05/2024	B-26	Livestock	GC	020	MIGC	Bovine	
04414370	06/06/2024	IS	0.13	0.90	Negative	10/05/2024	B-27	Livestock	GC	020	MIGC	Bovine	
04414371	06/06/2024	IS	0.04	0.30	Negative	10/05/2024	B-28	Livestock	GC	020	MIGC	Bovine	
04414372	06/06/2024	IS	0.28	2.00	Negative	10/05/2024	B-29	Livestock	GC	020	MIGC	Bovine	
04414373	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	CAP-21	Livestock	GC	011	MIGC	Caprine	
04414374	06/06/2024	IS	0.10	0.70	Negative	10/05/2024	CAP-22	Livestock	GC	011	MIGC	Caprine	
04414375	06/06/2024	IS	0.14	1.00	Negative	10/05/2024	CAP-23	Livestock	GC	011	MIGC	Caprine	
04414376	06/06/2024	IS	0.01	0.10	Negative	10/05/2024	CAP-24	Livestock	GC	033	MIGC	Caprine	
04414377	06/06/2024	IS	0.10	0.70	Negative	10/05/2024	CAP-25	Livestock	GC	033	MIGC	Caprine	
04414378	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	OV-21	Livestock	GC	033	MIGC	Ovine	
04414379	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	OV-22	Livestock	GC	022	MIGC	Ovine	
04414380	06/06/2024	IS	0.00	0.00	Negative	10/05/2024	OV-23	Livestock	GC	022	MIGC	Ovine	
04414381	06/06/2024	IS	0.23	1.60	Negative	10/05/2024	OV-24	Livestock	GC	022	MIGC	Ovine	
04441677	26/06/2024	IS	0.00	0.00	Negative	18/06/2024	F24-14	CA	GC	026	AIAGC	Feline	5 months in a shelter, comes from a home
04441678	26/06/2024	IS	0.55	3.90	Negative	19/06/2024	F24-50	CA	GC	033	AIAGC	Feline	It comes from the natural environment at the Military Base.
04441679	26/06/2024	IS	0.13	0.90	Negative	19/06/2024	F24-48	CA	GC	033	Albergue	Feline	It comes from the natural environment at the Military Base.
04441680	26/06/2024	IS	0.00	0.00	Negative	20/06/2024	F24-73	CA	GC	026	Albergue	Feline	It comes from the natural environment in the mountain El Parital.
04441681	26/06/2024	IS	0.13	0.90	Negative	20/06/2024	F24-88	CA	GC	026	Albergue	Feline	From the natural environment in Calle de los picos

04441682	26/06/2024	IS	0.00	0.00	Negative	21/06/2024	F24-51	CA	GC	033	Albergue	Feline	It comes from the natural environment at the Military Base.
04441683	26/06/2024	IS	2.56	18.00	Negative	18/06/2024	CAN-1	CA	GC	011	VC	Canine	
04441684	26/06/2024	IS	0.88	6.20	Negative	25/06/2024	FEL-1	CA	GC	011	VC	Feline	
04441685	26/06/2024	IS	1.92	13.50	Negative	25/06/2024	FEL-2	CA	GC	011	VC	Feline	Colony cat

Table annex I: Identification (ID), Investigation sample (IS), Companion Animal (CA), Gran Canaria (GC), Centro Insular de Recuperación de Fauna Silvestre de Tafira (CIRFST), Matadero Insular de Gran Canaria (MIGC), Albergue Insular de Animales de Gran Canaria (AIAGC), Veterinary Clinic (VC).

Municipality	AGUIMES	GALDAR	INGENIO	MOYA	LAS PALMAS DE G.C.	SAN BARTOLOME	LA ALDEA	SANTA BRÍGIDA	SANTA LUCÍA	SANTA MARÍA DE GUÍA	TEJEDA	TELDE	TEROR	VALSEQUILLO	VALLESECO	VEGA DE SAN MATEO
Municipality code	002	009	011	013	016	019	020	021	022	023	025	026	027	031	032	033

Tabel Annex II. PCR results.

ID	PCR COVID	PCR INFL	PCR SRV	Sampling date	Origin reference	GROUP	ISLAND	Municipality code	Location	Species	Observations
04403799	Negative	Negative	Negative	25/04/2024	0210/24	Fauna	GC	016	CIRFST	*L-Michelis*	
04403800	Negative	Negative	Negative	25/04/2024	0214/24	Fauna	GC	016	CIRFST	*Pardela Cenicienta*	
04403801	Negative	Negative	Negative	25/04/2024	0225/24	Fauna	GC	016	CIRFST	Duck	
04403802	Negative	Negative	Negative	24/04/2024	B-10	Livestock	GC	011	MIGC	Bovine	76 months
04403803	Negative	Negative	Negative	24/04/2024	B-9	Livestock	GC	011	MIGC	Bovine	87 months
04403804	Negative	Negative	Negative	24/04/2024	B-8	Livestock	GC	027	MIGC	Bovine	92 months
04403805	Negative	Negative	Negative	24/04/2024	B-7	Livestock	GC	023	MIGC	Bovine	59 months
04403806	Negative	Negative	Negative	24/04/2024	B-6	Livestock	GC	022	MIGC	Bovine	55 months
04403807	Negative	Negative	Negative	24/04/2024	B-5	Livestock	GC	002	MIGC	Bovine	11 months
04403808	Negative	Negative	Negative	24/04/2024	B-4	Livestock	GC	013	MIGC	Bovine	14 months
04403809	Negative	Negative	Negative	24/04/2024	B-3	Livestock	GC	011	MIGC	Bovine	10 months
04403810	Negative	Negative	Negative	24/04/2024	CON-9	Livestock	GC	011	MIGC	Rabbit	
04403811	Negative	Negative	Negative	24/04/2024	CON-8	Livestock	GC	011	MIGC	Rabbit	
04403812	Negative	Negative	Negative	24/04/2024	CON-6	Livestock	GC	011	MIGC	Rabbit	
04403813	Negative	Negative	Negative	24/04/2024	CON-7	Livestock	GC	011	MIGC	Rabbit	
04403814	Negative	Negative	Negative	24/04/2024	CON-10	Livestock	GC	011	MIGC	Rabbit	
04403815	Negative	Negative	Negative	24/04/2024	CON-5	Livestock	GC	032	MIGC	Rabbit	
04403816	Negative	Negative	Negative	24/04/2024	CON-4	Livestock	GC	032	MIGC	Rabbit	
04403817	Negative	Negative	Negative	24/04/2024	CON-3	Livestock	GC	032	MIGC	Rabbit	
04403818	Negative	Negative	Negative	24/04/2024	CON-2	Livestock	GC	032	MIGC	Rabbit	
04403819	Negative	Negative	Negative	24/04/2024	CON-1	Livestock	GC	032	MIGC	Rabbit	
04403820	Negative	Negative	Negative	24/04/2024	B-2	Livestock	GC	02	MIGC	Bovine	70 months
04403821	Negative	Negative	Negative	24/04/2024	B-1	Livestock	GC	016	MIGC	Bovine	12 months
04403822	Negative	Negative	Negative	23/04/2024	PO-10	Livestock	GC	02	MIGC	Porcine	

04403823	Negative	Negative	Negative	23/04/2024	PO-9	Livestock	GC	027	MIGC	Porcine	
04403824	Negative	Negative	Negative	23/04/2024	PO-8	Livestock	GC	019	MIGC	Porcine	
04403825	Negative	Negative	Negative	23/04/2024	PO-7	Livestock	GC	019	MIGC	Porcine	
04403826	Negative	Negative	Negative	23/04/2024	PO-6	Livestock	GC	026	MIGC	Porcine	
04403827	Negative	Negative	Negative	23/04/2024	PO-1	Livestock	GC	026	MIGC	Porcine	
04403828	Negative	Negative	Negative	23/04/2024	PO-5	Livestock	GC	026	MIGC	Porcine	
04403829	Negative	Negative	Negative	23/04/2024	PO-3	Livestock	GC	02	MIGC	Porcine	
04403830	Negative	Negative	Negative	23/04/2024	PO-4	Livestock	GC	02	MIGC	Porcine	
04403831	Negative	Negative	Negative	23/04/2024	PO-2	Livestock	GC	026	MIGC	Porcine	
04403832	Negative	Negative	Negative	24/04/2024	CAP-1	Livestock	GC	011	MIGC	Caprine	
04403833	Negative	Negative	Negative	24/04/2024	CAP-2	Livestock	GC	011	MIGC	Caprine	
04403834	Negative	Negative	Negative	25/04/2024	CAP-6	Livestock	GC	02	MIGC	Caprine	<12 months
04403835	Negative	Negative	Negative	24/04/2024	CAP-5	Livestock	GC	011	MIGC	Caprine	
04403836	Negative	Negative	Negative	25/04/2024	CAP-7	Livestock	GC	02	MIGC	Caprine	<12 months
04403837	Negative	Negative	Negative	25/04/2024	CAP-8	Livestock	GC	013	MIGC	Caprine	>12 months
04403838	Negative	Negative	Negative	25/04/2024	CAP-9	Livestock	GC	013	MIGC	Caprine	>12 months
04403839	Negative	Negative	Negative	25/04/2024	CAP-10	Livestock	GC	013	MIGC	Caprine	>12 months
04403840	Negative	Negative	Negative	24/04/2024	CAP-4	Livestock	GC	011	MIGC	Caprine	
04403841	Negative	Negative	Negative	24/04/2024	CAP-3	Livestock	GC	011	MIGC	Caprine	
04403842	Negative	Negative	Negative	25/04/2024	OV-9	Livestock	GC	032	MIGC	Ovine	>12 months
04403843	Negative	Negative	Negative	25/04/2024	OV-10	Livestock	GC	032	MIGC	Ovine	>12 months
04403844	Negative	Negative	Negative	18/06/2024	F1	Livestock	GC	032	MIGC	Ovine	<12 months
04403845	Negative	Negative	Negative	25/04/2024	OV-7	Livestock	GC	032	MIGC	Ovine	<12 months
04403846	Negative	Negative	Negative	25/04/2024	OV-6	Livestock	GC	022	MIGC	Ovine	<12 months
04403847	Negative	Negative	Negative	25/04/2024	OV-5	Livestock	GC	022	MIGC	Ovine	<12 months
04403848	Negative	Negative	Negative	25/04/2024	OV-4	Livestock	GC	022	MIGC	Ovine	<12 months
04403849	Negative	Negative	Negative	25/04/2024	OV-3	Livestock	GC	022	MIGC	Ovine	<12 months
04403850	Negative	Negative	Negative	24/04/2024	OV-2	Livestock	GC	09	MIGC	Ovine	

04403851	Negative	Negative	Negative	24/04/2024	OV-1	Livestock	GC	09	MIGC	Ovine	
04404522	Negative	Negative	Negative	15/05/2024	168/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404523	Negative	Negative	Negative	15/05/2024	322/24	Fauna	GC	016	CIRFST	Martinete	
04404524	Negative	Negative	Negative	15/05/2024	326/24	Fauna	GC	016	CIRFST	Pardela Cenicienta	
04404525	Negative	Negative	Negative	15/05/2024	183/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404526	Negative	Negative	Negative	15/05/2024	228/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404527	Negative	Negative	Negative	25/04/2024	228/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404528	Negative	Negative	Negative	25/04/2024	Erizo Moruno	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04404529	Negative	Negative	Negative	25/04/2024	60/24	Fauna	GC	016	CIRFST	Guion Africano	
04404530	NO SAMPLE	NO SAMPLE	NO SAMPLE	25/04/2024	Búho Chico	Fauna	GC	016	CIRFST	Búho Chico	
04411201	Negative	Negative	Negative	02/05/2024	CON-1	Livestock	GC	032	MIGC	Rabbit	
04411202	Negative	Negative	Negative	02/05/2024	CON-2	Livestock	GC	032	MIGC	Rabbit	
04411203	Negative	Negative	Negative	02/05/2024	CON-3	Livestock	GC	032	MIGC	Rabbit	
04411204	Negative	Negative	Negative	02/05/2024	CON-4	Livestock	GC	032	MIGC	Rabbit	
04411205	Negative	Negative	Negative	02/05/2024	CON-5	Livestock	GC	032	MIGC	Rabbit	
04411206	Negative	Negative	Negative	02/05/2024	CON-6	Livestock	GC	011	MIGC	Rabbit	
04411207	Negative	Negative	Negative	02/05/2024	CON-7	Livestock	GC	011	MIGC	Rabbit	
04411208	Negative	Negative	Negative	02/05/2024	CON-8	Livestock	GC	011	MIGC	Rabbit	
04411209	Negative	Negative	Negative	02/05/2024	CON-9	Livestock	GC	011	MIGC	Rabbit	
04411210	Negative	Negative	Negative	02/05/2024	CON-10	Livestock	GC	011	MIGC	Rabbit	
04411211	Negative	Negative	Negative	29/04/2024	OV-1	Livestock	GC	031	MIGC	Ovine	>18 months
04411212	Negative	Negative	Negative	29/04/2024	OV-3	Livestock	GC	033	MIGC	Ovine	>18 months
04411213	Negative	Negative	Negative	02/05/2024	OV-9	Livestock	GC	09	MIGC	Ovine	>18 months
04411214	Negative	Negative	Negative	02/05/2024	OV-10	Livestock	GC	09	MIGC	Ovine	>18 months
04411215	Negative	Negative	Negative	29/04/2024	CAP-1	Livestock	GC	031	MIGC	Caprine	>18 months
04411216	Negative	Negative	Negative	29/04/2024	CAP-2	Livestock	GC	031	MIGC	Caprine	>18 months
04411217	Negative	Negative	Negative	29/04/2024	CAP-3	Livestock	GC	031	MIGC	Caprine	>18 months

04411218	Negative	Negative	Negative	02/05/2024	CAP-4	Livestock	GC	019	MIGC	Caprine	
04411219	Negative	Negative	Negative	02/05/2024	CAP-5	Livestock	GC	019	MIGC	Caprine	
04411220	Negative	Negative	Negative	02/05/2024	CAP-6	Livestock	GC	019	MIGC	Caprine	
04411221	Negative	Negative	Negative	02/05/2024	CAP-7	Livestock	GC	019	MIGC	Caprine	
04411222	Negative	Negative	Negative	30/04/2024	P1	Livestock	GC	02	MIGC	Porcine	Bait
04411223	Negative	Negative	Negative	30/04/2024	P2	Livestock	GC	25	MIGC	Porcine	Bait
04411224	Negative	Negative	Negative	30/04/2024	P3	Livestock	GC	025	MIGC	Porcine	Bait
04411225	Negative	Negative	Negative	30/04/2024	P4	Livestock	GC	027	MIGC	Porcine	Bait
04411226	Negative	Negative	Negative	30/04/2024	P5	Livestock	GC	026	MIGC	Porcine	Bait
04411227	Negative	Negative	Negative	30/04/2024	P6	Livestock	GC	026	MIGC	Porcine	Bait
04411228	Negative	Negative	Negative	30/04/2024	P7	Livestock	GC	026	MIGC	Porcine	Bait
04411229	Negative	Negative	Negative	30/04/2024	P8	Livestock	GC	026	MIGC	Porcine	Bait
04411230	Negative	Negative	Negative	30/04/2024	P9	Livestock	GC	02	MIGC	Porcine	Bait
04411231	Negative	Negative	Negative	30/04/2024	P10	Livestock	GC	02	MIGC	Porcine	Reproducer
04411232	Negative	Negative	Negative	29/04/2024	B1	Livestock	GC	02	MIGC	Bovine	15 months
04411233	Negative	Negative	Negative	29/04/2024	B2	Livestock	GC	02	MIGC	Bovine	12 months
04411234	Negative	Negative	Negative	29/04/2024	B3	Livestock	GC	022	MIGC	Bovine	14 months
04411235	Negative	Negative	Negative	02/05/2024	B4	Livestock	GC	026	MIGC	Bovine	12 months
04411236	Negative	Negative	Negative	02/05/2024	B5	Livestock	GC	02	MIGC	Bovine	12 months
04411237	Negative	Negative	Negative	02/05/2024	B6	Livestock	GC	026	MIGC	Bovine	12 months
04411238	Negative	Negative	Negative	02/05/2024	B7	Livestock	GC	02	MIGC	Bovine	11 months
04411239	Negative	Negative	Negative	02/05/2024	B8	Livestock	GC	02	MIGC	Bovine	11 months
04411240	Negative	Negative	Negative	02/05/2024	B9	Livestock	GC	022	MIGC	Bovine	12 months
04411241	Negative	Negative	Negative	02/05/2024	B10	Livestock	GC	022	MIGC	Bovine	12 months
04411242	Negative	Negative	Negative	02/05/2024	B11	Livestock	GC	022	MIGC	Bovine	12 months
04411243	Negative	Negative	Negative	02/05/2024	B12	Livestock	GC	022	MIGC	Bovine	11 months
04411244	Negative	Negative	Negative	03/05/2024	B13	Livestock	GC	013	MIGC	Bovine	55 months
04411245	Negative	Negative	Negative	03/05/2024	B14	Livestock	GC	021	MIGC	Bovine	20 months

04411246	Negative	Negative	Negative	03/05/2024	B15	Livestock	GC	032	MIGC	Bovine	14 months
04411247	Negative	Negative	Negative	03/05/2024	B16	Livestock	GC	023	MIGC	Bovine	15 months
04411248	Negative	Negative	Negative	03/05/2024	B17	Livestock	GC	020	MIGC	Bovine	13 months
04411249	Negative	Negative	Negative	03/05/2024	B18	Livestock	GC	020	MIGC	Bovine	13 months
04411250	Negative	Negative	Negative	03/05/2024	B19	Livestock	GC	20	MIGC	Bovine	13 months
04411253	NO SAMPLE	NO SAMPLE	NO SAMPLE	05/06/2024	413/24	Fauna	GC	016	CIRFST	*A. otus*	
04411254	Negative	Negative	Negative	05/06/2024	319/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04411255	Negative	Negative	Negative	05/06/2024	362/24	Fauna	GC	016	CIRFST	Pardela Cenicienta	
04411256	Negative	Negative	Negative	15/05/2024	293/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04411257	Negative	Negative	Negative	15/05/2024	293/24	Fauna	GC	016	CIRFST	*Atelerix algirus*	
04411258	Negative	Negative	Negative	15/05/2024	264/24	Fauna	GC	016	CIRFST	*Tadorna ferruginea*	
04411259	Negative	Negative	Negative	10/05/2024	B41	Livestock	GC	026	MIGC	Bovine	
04411260	Negative	Negative	Negative	10/05/2024	B-40	Livestock	GC	002	MIGC	Bovine	
04411261	Negative	Negative	Negative	10/05/2024	B-39	Livestock	GC	002	MIGC	Bovine	
04411262	Negative	Negative	Negative	10/05/2024	B-38	Livestock	GC	020	MIGC	Bovine	
04411263	Negative	Negative	Negative	10/05/2024	B-37	Livestock	GC	020	MIGC	Bovine	
04411264	Negative	Negative	Negative	10/05/2024	B-36	Livestock	GC	020	MIGC	Bovine	
04411265	Negative	Negative	Negative	10/05/2024	B-35	Livestock	GC	016	MIGC	Bovine	
04411266	Negative	Negative	Negative	10/05/2024	B-34	Livestock	GC	016	MIGC	Bovine	
04411267	Negative	Negative	Negative	10/05/2024	B-33	Livestock	GC	020	MIGC	Bovine	
04411268	Negative	Negative	Negative	10/05/2024	B-32	Livestock	GC	022	MIGC	Bovine	
04411269	Negative	Negative	Negative	10/05/2024	B-31	Livestock	GC	022	MIGC	Bovine	
04411270	Negative	Negative	Negative	10/05/2024	B-30	Livestock	GC	022	MIGC	Bovine	
04414344	Negative	Negative	Negative	10/05/2024	CON-21	Livestock	GC	013	MIGC	Rabbit	
04414345	Negative	Negative	Negative	10/05/2024	CON-22	Livestock	GC	021	MIGC	Rabbit	
04414346	Negative	Negative	Negative	10/05/2024	CON-23	Livestock	GC	032	MIGC	Rabbit	

04414347	Negative	Negative	Negative	10/05/2024	CON-24	Livestock	GC	023	MIGC	Rabbit	
04414348	Negative	Negative	Negative	10/05/2024	CON-25	Livestock	GC	020	MIGC	Rabbit	
04414349	Negative	Negative	Negative	10/05/2024	CON-26	Livestock	GC	026	MIGC	Rabbit	
04414350	Negative	Negative	Negative	10/05/2024	CON-27	Livestock	GC	026	MIGC	Rabbit	
04414351	Negative	Negative	Negative	10/05/2024	CON-28	Livestock	GC	033	MIGC	Rabbit	
04414352	Negative	Negative	Negative	10/05/2024	CON-29	Livestock	GC	011	MIGC	Rabbit	
04414353	Negative	Negative	Negative	10/05/2024	CON-30	Livestock	GC	011	MIGC	Rabbit	
04414354	Negative	Negative	Negative	10/05/2024	P-21	Livestock	GC	025	MIGC	Porcine	
04414355	Negative	Negative	Negative	10/05/2024	P-22	Livestock	GC	025	MIGC	Porcine	
04414356	Negative	Negative	Negative	10/05/2024	P-23	Livestock	GC	026	MIGC	Porcine	
04414357	Negative	Negative	Negative	10/05/2024	P-24	Livestock	GC	026	MIGC	Porcine	
04414358	Negative	Negative	Negative	10/05/2024	P-25	Livestock	GC	002	MIGC	Porcine	
04414359	Negative	Negative	Negative	10/05/2024	P-26	Livestock	GC	002	MIGC	Porcine	
04414360	Negative	Negative	Negative	10/05/2024	P-27	Livestock	GC	002	MIGC	Porcine	
04414361	Negative	Negative	Negative	10/05/2024	P-28	Livestock	GC	026	MIGC	Porcine	
04414362	Negative	Negative	Negative	10/05/2024	P-29	Livestock	GC	002	MIGC	Porcine	
04414363	Negative	Negative	Negative	10/05/2024	P-30	Livestock	GC	002	MIGC	Porcine	
04414364	Negative	Negative	Negative	10/05/2024	B-21	Livestock	GC	020	MIGC	Bovine	
04414365	Negative	Negative	Negative	10/05/2024	B-22	Livestock	GC	020	MIGC	Bovine	
04414366	Negative	Negative	Negative	10/05/2024	B-23	Livestock	GC	020	MIGC	Bovine	
04414367	Negative	Negative	Negative	10/05/2024	B-24	Livestock	GC	016	MIGC	Bovine	
04414368	Negative	Negative	Negative	10/05/2024	B-25	Livestock	GC	016	MIGC	Bovine	
04414369	Negative	Negative	Negative	10/05/2024	B-26	Livestock	GC	020	MIGC	Bovine	
04414370	Negative	Negative	Negative	10/05/2024	B-27	Livestock	GC	020	MIGC	Bovine	
04414371	Negative	Negative	Negative	10/05/2024	B-28	Livestock	GC	020	MIGC	Bovine	
04414372	Negative	Negative	Negative	10/05/2024	B-29	Livestock	GC	020	MIGC	Bovine	
04414373	Negative	Negative	Negative	10/05/2024	CAP-21	Livestock	GC	011	MIGC	Caprine	
04414374	Negative	Negative	Negative	10/05/2024	CAP-22	Livestock	GC	011	MIGC	Caprine	

04414375	Negative	Negative	Negative	10/05/2024	CAP-23	Livestock	GC	011	MIGC	Caprine	
04414376	Negative	Negative	Negative	10/05/2024	CAP-24	Livestock	GC	033	MIGC	Caprine	
04414377	Negative	Negative	Negative	10/05/2024	CAP-25	Livestock	GC	033	MIGC	Caprine	
04414378	Negative	Negative	Negative	10/05/2024	OV-21	Livestock	GC	033	MIGC	Ovine	
04414379	Negative	Negative	Negative	10/05/2024	OV-22	Livestock	GC	022	MIGC	Ovine	
04414380	Negative	Negative	Negative	10/05/2024	OV-23	Livestock	GC	022	MIGC	Ovine	
04414381	Negative	Negative	Negative	10/05/2024	OV-24	Livestock	GC	022	MIGC	Ovine	
04441677	Negative	Negative	Negative	18/06/2024	F24-14	CA	GC	026	AIAGC	Feline	5 months in a shelter, comes from a home
04441678	Negative	Negative	Negative	19/06/2024	F24-50	CA	GC	033	AIAGC	Feline	It comes from the natural environment at the Military Base.
04441679	Negative	Negative	Negative	19/06/2024	F24-48	CA	GC	033	Albergue	Feline	It comes from the natural environment at the Military Base.
04441680	Negative	Negative	Negative	20/06/2024	F24-73	CA	GC	026	Albergue	Feline	It comes from the natural environment in the mountain El Parital.
04441681	Negative	Negative	Negative	20/06/2024	F24-88	CA	GC	026	Albergue	Feline	From the natural environment in Calle de los picos
04441682	Negative	Negative	Negative	21/06/2024	F24-51	CA	GC	033	Albergue	Feline	It comes from the natural environment at the Military Base.
04441683	Negative	Negative	Negative	18/06/2024	CAN-1	CA	GC	011	VC	Canine	
04441684	Negative	Negative	Negative	25/06/2024	FEL-1	CA	GC	011	VC	Feline	
04441685	Negative	Negative	Negative	25/06/2024	FEL-2	CA	GC	011	VC	Feline	Colony cat

Table annex II: Identification (ID), Companion Animal (CA), Gran Canaria (GC), Centro Insular de Recuperación de Fauna Silvestre de Tafira (CIRFST), Matadero Insular de Gran Canaria (MIGC), Albergue Insular de Animales de Gran Canaria (AIAGC), Veterinary Clinic (VC).

Municipality	AGUIMES	GALDAR	INGENIO	MOYA	LAS PALMAS DE G.C.	SAN BARTOLOME	LA ALDEA	SANTA BRÍGIDA	SANTA LUCÍA	SANTA MARÍA DE GUÍA	TEJEDA	TELDE	TEROR	VALSEQUILLO	VALLESECO	VEGA DE SAN MATEO
Municipality code	002	009	011	013	016	019	020	021	022	023	025	026	027	031	032	033