

**A dieta das greas de garranos salvaxes (*Equus ferus atlanticus*) da parte norte da Serra do Seixo (Pontevedra)**

**The diet of the herd of garrano wild horses (*Equus ferus atlanticus*) in the Northern part of Serra do Seixo (Pontevedra)**

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**RESUMO / ABSTRACT**

En 36 visitas, 3 mensuais, entre outubro de 2014 e setembro do 2015 inclusive, acumuláronse 4425 datos puntuais sobre a dieta natural dos garranos salvaxes (*Equus ferus atlanticus*) da metade norte da serra do Seixo (Galicia).

Promedio anual: 65,75 % herbáceas; 32,36% toxos (*Ulex sp.*). Son minoritarios: *Rubus sp.* (0,16%); *Pteridium aquilinum* (1,27%) e toxos (*Ulex sp.*) queimados (0,43%). Non consumían: *Cytisus scoparius*, *Genista florida*, nin Ericaceae. Un só dato de *Erica cinerea* é a excepción.

O máximo consumo de toxos (*Ulex sp.*) foi de 51,7% en xuño e o mínimo no outono – inverno (entre 18,2% e 22%). Os fentos *Pteridium aquilinum* eran consumidos en xullo-agosto, tal vez polas súas cualidades vermífugas. O consumo de herbáceas aumentaba no inverno.

A poboación de 360 – 380 garranos da serra consume anualmente entre 720 e 901 toneladas de toxo (*Ulex sp.*), esta estimación é á baixa, pois non incluímos os poldros de tempada.

Os garranos son os herbívoros clave en Galicia. Abren claros e melloran o pasto para outros herbívoros.

From October 2014 to September 2015 inclusive, 4425 pieces of data about the natural diet of Garrano wild horses (*Equus ferus atlanticus*) in the northern part of Serra do Seixo (Galicia) were gathered in 36 visits, 3 per month.

Annual average: 65.75% herbaceous plants and 32.36% gorse (*Ulex sp.*). In small quantities: *Rubus sp.* (0.16%), *Pteridium aquilinum* (1.27%) and burnt gorse (*Ulex sp.*) (0.43%). They did not consume *Cytisus scoparius*, *Genista florida* or Ericaceae. Only one piece of data of *Erica cinerea* was an exception.

The maximum consumption of gorse (*Ulex sp.*) was 51.7% in June and the minimum in autumn and winter (between 18.2% and 22%). Eagle fern (*Pteridium aquilinum*) was consumed in July and August, possibly due to its vermicide action. The consumption of herbaceous plants increased in winter.

The population of 360 - 380 Garranos in Serra do Seixo ingest between 720 and 901 tonnes of gorse

(*Ulex* sp.) annually. This estimation is adjusted downwards, since foals were not included.

Garrano wild horses are the key herbivore in Galicia. They create clearings and improve the pasture for other herbivores.

## PALABRAS CLAVE / KEY WORDS

Dieta, estacionalidade, garranos salvaxes (*Equus ferus atlanticus*), L.I.C. Seixo - Cando, Galicia.

Diet, seasonal variation, Garrano wild horses (*Equus ferus atlanticus*), SCI Seixo - Cando, Galicia.

## INTRODUCCIÓN

As pormenorizadas descrições dos garranos galegos feitas por P.J. Iglesia e R. Magdalena e T. Vidal (IGLESIA, 1973; MAGDALENA e VIDAL, 1987) concluíron no recente recoñecemento do nivel subespecífico para os garranos, ou cabalos salvaxes do norte ibérico. Así foron recentemente denominados como *Equus ferus atlanticus* (BÁRCENA, 2012).

Moitos traballos de investigación ou divulgativos estaban orientados ó coñecemento das relación dos garranos salvaxes cos seus depredadores naturais (LAGOS, 2013; BAS, 2016; GUITIAN, *et al.*, 1979; SAZATORNIL, 2008; LLANEZA, 2016)

Pero a información sobre o seu papel como herbívoro grande sobre a vexetación, aínda é escasa.

Diversos autores sinalan aos garranos salvaxes como herbívoros que frecuentemente ramonean matogueira. Así controlan o crecemento do matogueira, abren claros, melloran o pasto herbáceo, facilitan a extinción das queimas forestais e favorecen a diversidade botánica e de insectos ( GARCÍA, *et al.*, 2009; LÓPEZ – BAO, *et al.*, 2013; MOSQUERA – LOSADA, 2013; RIGUEIRO RODRÍGUEZ *et al.*, 2004; RIGUEIRO RODRÍGUEZ *et al.*, 2005).

Os efectos da acción dos garranos sobre a vexetación empezan a ser coñecidos. Pero realmente non dispoñiamos de datos estatísticos sobre a dieta dos garranos salvaxes.

Por todo isto pareceunos interesante iniciar un traballo de campo que proporcionase unhas conclusións máis precisas, estatisticamente, sobre a composición da dieta dos garranos salvaxes. Tamén sobre a relación dos cambios na súa dieta cos cambios ambientais.

## INTRODUCTION

The detailed descriptions of Galician Garranos written by P.J. Iglesia and R. Magdalena and T. Vidal (Iglesia, 1973; Magdalena, and Vidal, 1987) concluded in the recent acknowledgement of the subspecific level for Garranos or Northern Iberian Wild horses. This is how they were recently named as *Equus ferus atlanticus* (Barcena, 2012).

Many research and informative works were aimed at the study of the relationship between the Garrano wild horses and their natural predators (Lagos, 2013; Bas, 2016; Guitian *et al.*, 1979; Saztornil, 2008; Llaneza, 2016). However, the information about their effect on the vegetation as big herbivores is still scarce.

Different authors describe Garrano wild horses as herbivores that often browse on scrub. In this way, they control the growth of scrub, create clearings, improve herbaceous pastures, help extinguish forest fires and favour botanical and insect diversity (García *et al.*, 2009; Lopez - Bao. *et al.*, 2013; Mosquera - Losada, 2013; Rigueiro - Rodriguez *et al.*, 2004; Rigueiro - Rodriguez *et al.*, 2005).

The effects of Garrano Wild horses on the vegetation are starting to be known (Fagundez, 2016). However, there is not actually statistical data about the diet of Garrano wild horses at present.

For all these reasons, we found it interesting to begin field work that provided more accurate conclusions, statistically speaking, about the composition of the diet of Garranos as well as the connection between the changes in their diet and the environmental changes.

## MÉTODO

A área de estudio atópase na metade norte da serra do Seixo (L.I.C. Seixo - Cando), Pontevedra.

A vexetación da serra do Seixo (1.024 m) por riba de 650 m de altitude está constituída por matogueiras de toxos (*Ulex sp.*), pequenos ucedos (*Erica arborea*, *Erica sp.*, *Calluna vulgaris*), pequenas xesteiras (*Cytisus scoparius*), e piorneiras (*Genista florida*). Tamén hai brañas con *Erica tetralix* e pasteiros húmidos, bastante extensos na zona de estudo; pero non tanto no resto da serra.

A elevada pluviometría permite que dita vexetación se manteña verde boa parte do ano (máis de 1900 l/m<sup>2</sup> anual de media). Tamén mantén moitos mananciais. Todo isto permite a supervivencia de gando vacún extensivo (unhas 200 cabezas) e de moitas greas de garranos salvaxes. Uns 360 – 380 garranos salvaxes viven nesta serra, sen contar os poldros de tempada.

Os datos de pluviometría que expoñemos corresponden ó período de estudio na estación meteorolóxica máis próxima, sita a 15 km ó sur e a 750 m de altitude (Fornelos de Montes).

As pistas forestais abertas para un parque eólico facilitounos o acceso á serra e a localización das greas de garranos.

Fixéronse tres visitas mensuais desde outubro de 2014 a setembro de 2015 inclusives. Aproveitábanse as catro derradeiras horas do día, pois os garranos solen estar máis activos. En coche localizábanse entre 4 e 8 greas cada día.

En cada grea se realizaban tres observacións espazadas dous minutos entre elas.

En cada observación tomábase nota do que estaba a comer cada animal no mesmo momento de ser visto (un dato). Distinguíamos en datos individuais: herbáceas, toxo (*Ulex sp.*), ericáceas (*Erica/Calluna*), xesta (*Cytisus scoparius*), piorno (*Genista florida*), silvas (*Rubus sp.*) e fentos de monte (*Pteridium aquilinum*). Este método púxose a punto en maio – setembro do 2014.

As observacións facíanse a distancias de entre 20 m e 90 m, para non molestalos, utilizando prismáticos 8X e 16X.

Sómente en dúas ocasións, utilizouse telescopio

## METHODOLOGY

The area of study for this work is located in the northern half of Serra do Seixo (SCI Seixo - Cando), Pontevedra.

The vegetation in Serra do Seixo (1.024 m) above an altitude of 650 m, comprises shrublands of gorse (*Ulex sp.*), small heath shrubs (*Erica arborea*, *Erica sp.*, *Calluna vulgaris*), small broom shrubs (*Cytisus scoparius*) and bridal broom shrubs (*Genista florida*). There are also marshlands with *Erica tetralix* and wet pastures, quite extensive in the area of study but not so much in the rest of the mountain range.

The heavy rainfall enables this vegetation to keep green for a great part of the year (More than 1900 l/m<sup>2</sup>. per year on average). It also maintains many natural springs. All this enables the survival of extensive bovine cattle (around 200 heads) and a large number of herds of Garrano wild horses. About 360 - 380 garranos live in this mountain range, without taking into account seasonal foals.

The rainfall data we present in this work corresponds to the period of study at the nearest weather station, located at 15 km to the south and 750 m above sea level (Fornelos de Montes).

The forest trails made for a wind farm provided us the access to the mountain and the localization of the herds of Garranos.

Three monthly visits were made from October 2014 to September 2015 inclusive. The last four hours of the day were used, since Garrano wild horses are usually more active at that time. Between 4 and 8 herds were located by car daily.

Three observation visits were made to each herd with a difference of two minutes between them.

During each observation we took note of what each animal was eating at the moment it was seen (a piece of information). Individual data was distinguished: herbaceous plants, gorse (*Ulex sp.*), Ericaceae plants (*Erica / Calluna*), common broom (*Cytisus scoparius*), bridal broom (*Genista Florida*), bramble (*Rubus sp.*) and eagle fern (*Pteridium aquilinum*). This methodology was set in May – September, 2014.

20x – 60x para distancias de 100 m – 130 m.

Non se tomou ningún dato de poldros de tempada. Foron excluídos neste traballo.

En total fixéronse 36 visitas á serra. Realizáronse 594 observacións en 198 greas e acumuláronse 4.425 datos individuais. Isto supón unha media de 5,5 greas observadas tres veces en cada visita.

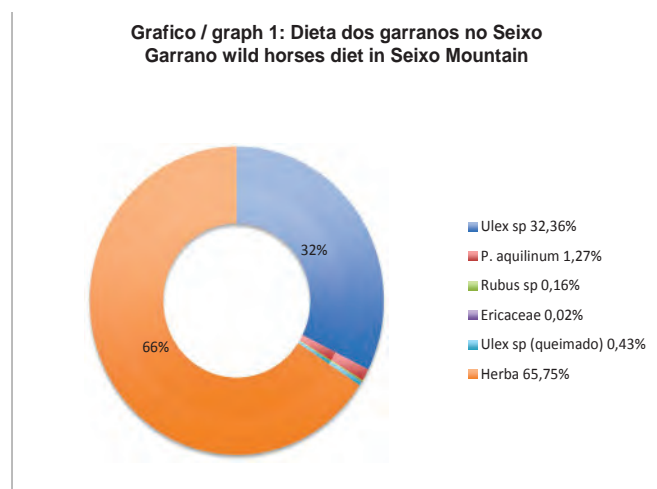
En cada visita tomáronse datos do estado do toxo. En concreto: a qué altitudes da serra había toxo con brote. Non se tomaron datos por baixo dos 600 m de altitude.

Os resultados expresámoslos en número e porcentaxe, tanto por meses, como no total anual.

## RESULTADOS

a) Total anual:

Na gráfica 1 exprésanse as proporcións en que os garranos salvaxes do Seixo comían diversas plantas no conxunto de todo o ano.



Hai que engadir un único dato dun garrano comendo terra negra non incluído na táboa. A arxila era comida con frecuencia polos rebezos de Picos de Europa, posiblemente para evitar os efectos dos alcaloides dalgunhas herbas. (BAS, 2014). Tal vez fose tamén ese o motivo no presente caso.

Resulta evidente que os dous compoñentes básicos da dieta diaria destes garranos eran herbáceas e toxos.

Tamén teñen certa importancia os fentos de monte, *Pteridium aquilinum*, (1,27 %), as silvas do xénero *Rubus* (0,16 %) e os toxos recién queimados (0,43 %).

The observations were made from a distance of 20 to 90 m, in order not to disturb them, using 8X and 16X binoculars. A 20X - 60X telescope was only used twice for distances of 100 - 130 m.

No data was taken about seasonal foals. They were excluded from this work.

36 observation visits to the mountain were made in total. 594 observations were made to 198 herds and 4,425 individual data was gathered. This means an average of 5.5 herds observed three times per visit.

Data about the state of the gorse was taken in each visit; specifically at what altitude gorse buds could be found. No data was gathered below 600 m of altitude.

The results were presented as figures and percentages, both monthly and for the annual total.

## RESULTS

A) Annual total

Figure 1 shows the proportion in which Garrano wild horses in Seixo consumed different plants throughout the whole year.

To this, an only piece of information should be added of a Garrano horse eating black soil, which has not been included in the graph above. Clay was frequently eaten by the chamois in Picos de Europa, probably to avoid the effects of the alkaloids that some herbs contain. (BAS, 2014). This might also be the reason in this particular case under study.

It seems clear that the two basic components of the daily diet of the Garranos under study were herbaceous plants and gorse. Eagle fern, *Pteridium aquilinum*, (1.27%), bramble of the *Rubus* genus (0.16%) and recently burnt gorse (0.43%) also seemed to be quite important in their diet.

They never ate:

Common broom (*Cytisus scoparius*) or Ericaceae plants, in spite of being abundant in the area of study. An only item of *Erica cinerea* among more than 4,000 is the exception that proves the rule.

They didn't eat bridal broom (*Genista florida*) either, a little scarce in the area of study. Ericaceae plants and common broom were frequently eaten by the cattle

Nunca comeron:

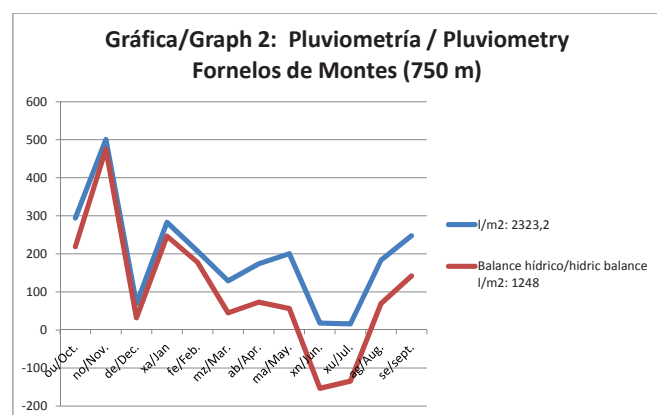
Xestas (*Cytisus scoparius*) nin ericáceas, a pesares de ser abundantes na área de estudio. Un único dato de *Erica cinerea* entre máis de 4.000 é a excepción que confirma a regra.

Tampouco comeron piornos (*Genista florida*), algo escasos na área de estudio. Ericáceas e xestas eran frecuentemente comidos polas vacas en extensivo do Seixo.

#### b) Variación estacional da dieta:

A gráfica 2 recolle os datos de pluviometría rexistrados durante o período de estudio na estación meteorolóxica máis próxima, Situada a 15 km e a 750 m de altitude. (Fornelos de Montes).

O inverno 2014-2015 foi de temperaturas suaves, pois só se rexistrou un día de xeadas en xaneiro e cinco en febreiro na estación de Fornelos de Montes.



A chuvia foi irregular. Foron especialmente secos os meses decembro do 2014, marzo, xuño e xullo do 2015. O balance hídrico tan negativo en xuño e xullo provocou un adianto da seca estival do pasto. O pasto reverdeceu grazas ás choivas da segunda quincena de agosto

Os fentos citados eran comidos en boa cantidade desde mediados de xullo a primeiros de setembro; pero durante poucos días. En ocasións a grea facíao de forma colectiva, coma se dun festín se tratase.

Comían follas e pólas novas das silvas, preferentemente en primavera, entre marzo e mediados de xuño. Só temos dous datos no verán. Para entón están máis secas e duras. As silvas son moi raras na área de estudio. Noutras serras poden ter máis importancia na dieta.

kept extensively in Seixo.

#### b) Seasonal variation in their diet:

Figure 2 gathers the rainfall data registered during the period under study at the nearest weather station, located 15 km from the area and at 750 meters above sea-level. (Fornelos de Montes).

In the winter 2014-2015 temperatures were mild, since ground frost was only registered one day in January and five in February at Fornelos de Montes weather station.

The rainfall was variable. December of 2014, and March, June and July of 2015 were specially dry months. The negative water balance in June and July made the summer drying of the pasture come earlier. The pasture grew green again thanks to the rains in the second fortnight of August.

The aforementioned eagle fern (*P. aquilinum*) was eaten in large quantities from the middle of July until the beginning of September, but during few days. On some occasions the herd consumed it collectively as if they were having a feast.

They ate leaves and young branches from the brambles (*Rubus sp*), mainly in spring, between March and the middle of June. Only two items were registered in summer, when they are drier and harder. The bramble in the area under study was very rare. In other mountain ranges it may be more important in their diet.

The data registered about Garrano wild horses eating recently burnt gorse was gathered in March 2015. It happened for few days and after some controlled fires. The Garrano horses of the herd affected by the fire willingly ate the charred spikes of the recently burnt gorse. The amount of gorse and grass consumed varied monthly. These variations appeared related to the changes seen in these types of vegetation.

Autumn:

Only a very little amount of gorse had sprouts in the area under study. Garrano horses ate little gorse (18.2% to 27.8%) in order to eat more grass.

Winter:

Gorse doesn't grow in winter and it is hard and even 5 - 10% of it dried up (In other colder winters, more

Os datos de garranos salvaxes comendo toxos recién queimados corresponden a marzo de 2015. Sucedeu durante poucos días. E aconteceu poucos días despois dunhas queimas controladas. Os garranos da grea afectada comían de boa gana os picos chamuscados dos toxos recién queimados.

Mes a mes as proporcións de toxos e de herba inxeridos variaban. Estas variacións aparecían relacionadas cos cambios, que se observaban nestas formas de vexetación.

**Outono:**

Só unha moi pequena proporción de toxo tiña gomo na área de estudio. Os garranos comían pouco toxo (18,2% a 27,8%) para comeren máis herba.

**Inverno:**

O toxo non crece, está duro e mesmo un 5 - 10 % dos toxos secábase (noutros invernos máis fríos secábase máis do 80%). Os garranos preferían comer herbáceas no inverno (70 a 80%), inda que estaban parcialmente secas polas xeadas. O consumo de toxo en xaneiro foi mínimo (21,1%).

**Primavera:**

Xa a finais de febreiro empezaba a aumentar a proporción de toxo inxerido (máis do 30 %), anticipándose algo ao comezo do crecemento dos toxos nas ladeiras baixas da zona de estudio.

O toxo chegará a superar o 50 % da dieta ó final da primavera. De maio a comezos de xullo prefiren o toxo á herba, a pesares de que ambos alimentos crecen moito.

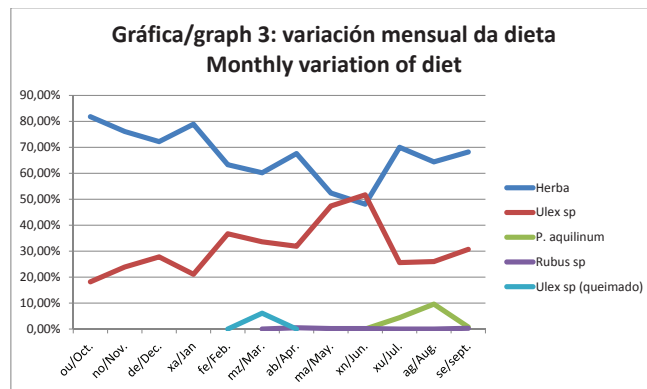
**Verán:**

A seca fíxose notar no pasto. Agotado o brote



Foto 1. Os garranos salvaxes do Seixo comen anualmente máis de 720 toneladas de toxos. Así favorecen as especies herbáceas.  
Photo 1. The garrano wild horses of Seixo Mountain eat annually more than 720 tons of gorse. Thus favoring herbaceous species.

than 80% dried up). Garranos preferred to eat herbaceous plants in winter (70 to 80%), although they were partially dried due to the cold temperatures and the frost. The consumption of gorse in January was minor (21.1%).



**Spring:**

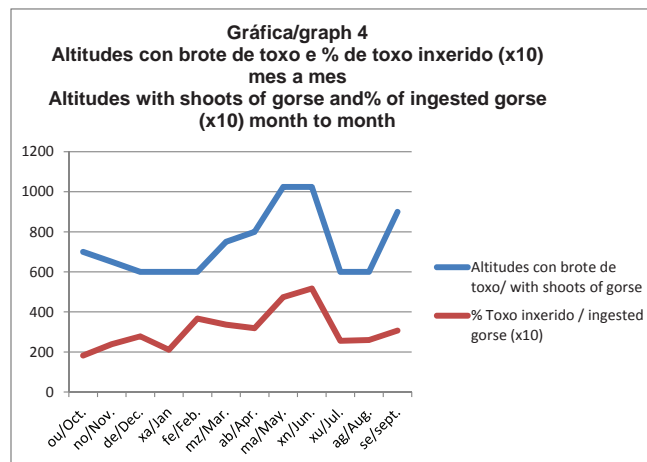
At the end of February the quantity of gorse eaten had already started to increase (more than 30%), some time before the gorse in the lower mountainsides of the area under study had started to grow.

Gorse will make more than 50% of their diet at the end of spring. From May to the beginning of July they prefer gorse to grass, despite the fact that both of them grow very much.

**Summer:**

The drought was noticeable in the pasture. Once the gorse buds are finished, it declines significantly as food in July and in the first fortnight of August. The herds preferred dry grass to dry and hard gorse.

In the second fortnight of August 2015 it rained heavily and they got back to the habit of eating gorse (more than 30%). Thus, a small rise on gorse consumption took place in September 2015.



do toxo, este decae moito como alimento en xullo e na primeira quincena de agosto. As greas preferían a herba seca ao toxo seco e duro.

Na segunda quincena de agosto de 2015 choveu moito e recuperaron o hábito de comeren toxos (máis do 30 %). Produciuse entón un pequeno reponte do consumo de toxo en setembro do 2015.

c) A procura do gomo de toxo:

Na gráfica 4 relaciónase o rango de altitudes da serra no que o toxo tiña gomo, mes a mes, coa proporción de toxo inxerido polos garranos salvaxes. Non se tomaron datos por baixo dos 600 m de altitude.

O brote do toxo comezou en marzal nas ladeiras baixas, para ir remontando a serra ata maio - xuño. Paralelamente o consumo de toxo ía en aumento. Algunhas greas subían polas ladeiras seguindo o gomo do toxo en primavera e buscando frescor.

En xullo o gomo de toxo quedou agotado e o seu consumo descendeu moito.

Un pequeno reponte do brote de toxo en setembro xustifica o lixeiro aumento da súa inxesta observado.

## DISCUSIÓN E CONCLUSIÓNS

A información dispoñible sobre a dieta dos garranos salvaxes en Galicia refírese de xeito xenérico aos seus hábitos ramoneadores de matogueira, concretamente toxo, sen precisar datos estatísticos.

Os citados traballos frecuentemente consideraban os efectos da acción dos garranos sobre a vexetación en condicións de catividade en parcelas grandes de monte cerradas (MOSQUERA, 2013; RIGUEIRO RODRÍGUEZ, *et al.*, 2013). Coinciden os autores en indicar o efecto beneficioso que teñen sobre o pasto herbáceo e tamén sobre a biodiversidade vexetal e de insectos.

No presente traballo podemos extraer as seguintes conclusións:

Os garranos salvaxes da serra do Seixo amosaron unha gran capacidade de flexibilizar a súa dieta adaptando esta á dispoñibilidade dos distintos tipos de pasto.

A dieta básica dos garranos salvaxes do Seixo compoñíase dunha combinación de herbáceas e toxos.



Foto 2: Brañas de Xestido, Seixo alto, en setembro do 2015. Pasto inusualmente verde debido ás chuvias de agosto. Os garranos volvían comer máis toxo, que volvía agromar.

Photo 2. Wetlands Xestido, high Seixo in September 2015. Unusually green Pasture due to rainy August. The garranos returned eat more gorse, returning to sprout.

C) Searching for gorse buds:

In figure 4 the height range of the mountain where there were gorse buds is related to the amount of gorse consumed by the Garrano wild horses on a monthly basis. No data was gathered below 600 m.

Gorse buds started to grow in March in the low mountainsides and spread up the mountain until May-June. At the same time, the consumption of gorse increased. Some herds went up the mountainsides following the gorse buds in spring as well as searching for freshness.

In July the gorse buds were depleted and its consumption decreased significantly.

A small increase of gorse buds in September justifies the slight rise of its consumption seen in figure 4.

## DISCUSSION AND CONCLUSIONS

The information available about the diet of Garrano wild horses in Galicia refers to their habits of browsing on scrub in a general way, specifically gorse, without specifying any statistical data.

These works often considered the effects of Garranos on the vegetation when they were kept in captivity in large closed plots of forest (MOSQUERA, 2013; RIGUEIRO RODRÍGUEZ *et al.*, 2013). These authors agree on noticing the beneficial effect they have on the herbaceous pasture and on the vegetable and insect

Variando a súa proporción ao longo do ano en función do estado da vexetación: seca, verde, brote, etc. A dieta podía sufrir cambios importantes en poucos días. Pero o maior consumo de toxo correspondeu a maio e xuño (máis do 50 %) e o mínimo a outubro (18,2%) e xaneiro (21,1%). Pero todo o ano ramoneaban moito toxo.

A primavera botánica comeza en marzal nas ladeiras baixas, pero non chega ata final de abril na serra alta. O mesmo calendario sofre o brote do toxo e a proporción de toxo ingerida polos garranos salvaxes.

En primavera os garranos buscan con avidez o brote de toxo. Algunhas greas remontan a serra en primavera seguindo o gomo do toxo ademais do ambiente fresco.

Os abondosos fentos de monte (*Pteridium aquilinum*) eran consumidos en gran cantidade en días concretos de xullo e agosto. Nunca en primavera, cando están tenros, nin ó final do verán, cando están secos. Consideramos que os comen polas súas cualidades medicinais, como vermífugos, para desparasitarse.

O feito de que tamén sexan consumidos polos poldros de tempada xunto ás súas nais explica a aprendizaxe e a transmisión xeneracional deste comportamento para desparasitarse (Foto 3).

Nunca comeron xestas (*Cytisus scoparius*), nin piornos (*Genista florida*), nin ericáceas (*Erica sp.*, *Calluna vulgaris*), aínda que estas últimas abundan na serra. Só temos un dato de *Erica cinerea* entre máis de 4000.

Poucas veces comeron silvas (*Rubus sp.*),



Foto 3. Poldra de catro meses comendo *Pteridium aquilinum* nas proximidades da súa nai. O Seixo, agosto de 2015

Photo 3. Four-month-old female foal eating *Pteridium aquilinum* nearby her mother. O Seixo, August 2015.

biodiversity.

A recent monitoring work of the herds of Garrano wild horses carried out in the north of Galicia has concluded that an intermediate density of Garrano horses in the mountains boosts herbaceous biodiversity and the quality of the pastureland. This doesn't happen when there are no Garranos in the area or when they appear on a very high density (FAGÚNDEZ, 2016).

In the present work we may come to the following conclusions:

The Garrano wild horses from Seixo showed a great ability to adapt their diet to the availability of the different types of pasture.

The Garrano wild horse's basic diet consisted of a combination of herbaceous plants and gorse, varying their proportion throughout the year depending on the state of the vegetation: dry, green, bud, etc. There could be important changes in the diet in few days. However, the largest amount of gorse (*Ulex sp.*) was consumed in May and June (more than 50%) and the minimum in October (18.2%) and January (21.1%). Nevertheless, they browsed on much gorse throughout the whole year.

Botanical spring starts in March at the lower mountainsides, but it does not come to the top until the end of April. The same calendar applies to the gorse bud and the amount of gorse ingested by Garrano wild horses. In spring Garranos look for gorse buds avidly. Some herds go up the mountains in spring following the gorse bud as well as a cool environment.

The abundant eagle fern (*Pteridium aquilinum*) was consumed in large quantities on specific days in July and August. It was never consumed in spring, when it is tender, or at the end of the summer, when it is dry. We consider that they eat it because of its medicinal qualities, as vermifuge, to get rid of parasites. The fact that eagle fern is also consumed by seasonal foals together with their mothers, explains the generational training and transmission of this behaviour in order to deworm (Photo 3).

They never ate common broom (*Cytisus scoparius*) or bridal broom (*Genista Florida*), neither Ericaceae plants (*Erica sp.*, *Calluna vulgaris*), although these latter are plentiful



preferentemente na primavera. Pero as silvas son moi raras na área de estudio.

Sería interesante ver o que sucede noutras serras onde as silvas abundan máis. De feito as observacións de garranos salvaxes comendo silvas son máis frecuentes na serra do Acibal (Moraña – Pontevedra).

Son capaces de comer os toxos (*Ulex sp.*) recién queimados e fano de boa gana. Este dato resulta moi interesante, pois explica a supervivencia dos garranos salvaxes nas durísimas condicións que atopan despois dos grandes incendios forestais (Foto 4).

Así sucedeu no 2006 en moitas serras da provincia de Pontevedra. A información dos besteiros (propietarios dos garranos salvaxes) corrobora estes datos. Moitos garranos sobreviviron no verán do 2006 comendo chamizos de toxo na serra da Groba e na serra do Acibal (Pontevedra).

Finalmente, tendo en conta que cada garrano salvaxe come a diario uns 17 – 20 kg de pasto verde, podemos extraer as seguintes conclusións:

De promedio, diariamente cada garrano do norte da serra do Seixo come uns 5,5 a 6,5 kg de toxos (*Ulex sp.*).

Anualmente cada garrano salvaxe da serra do Seixo come entre 2007 e 2237 kg de toxos.

A poboación de 360 – 380 garranos salvaxes do Seixo come anualmente unhas 722,5 a 901 toneladas de toxo (*Ulex sp.*) nas 3200 hectáreas de monte que ocupan. Iso sen contar cos poldros de tempada, que tamén comen moito toxo.

A paisaxe vexetal da outa serra do Seixo está modelada polos garranos salvaxes. Son o herbívoro clave. Ademais son a mellor medida preventiva contra os incendios forestais.

Estes simples datos deberían facer, que as administracións autonómica e estatal abandonen a súa política sancionadora contra os garranos salvaxes (Decreto de identificación equina 142/12 de 14 de xuño de 2012) para adoptar medidas de conservación deste herbívoro clave e representante emblemático da fauna salvaxe de Galicia.

Sería lamentable que, por falta de diálogo

in Serra do Seixo. We only registered one case of among more than 4,000.

Bramble (*Rubus sp.*) was eaten few times, mostly in spring, but this is very rare in the area of study.

It would be very interesting to see what happens in other mountains where there is more bramble. In fact the observations of Garrano wild horses eating bramble are more frequent in Serra do Acibal (Moraña - Pontevedra).

They are able to eat recently burnt gorse (*Ulex sp.*) and they do it with pleasure. This fact is very interesting, since it explains the survival of Garrano wild horses in very harsh conditions after the great forest fires. (Photo 4).



Foto 4: Poldro macho de tres anos comendo toxos (*Ulex sp.*) recién queimados. O Seixo, marzal de 2015.

Photo 4: A three-year-old colt eating recently burned gorse (*Ulex sp.*). O Seixo, March 2015.

This is what happened in 2006 in many mountains in the province of Pontevedra. This fact is confirmed by the information given by the besteiros (the owners of Garrano wild horses). A large number of Garranos survived eating half-burned gorse in Serra da Groba and in Serra do Acibal (Pontevedra) in the summer of 2006. Finally, taking into account that each Garrano wild horse eats about 17-20 kg of green pasture a day, according to the data gathered when they are kept in captivity, we can draw the following conclusions:

On average each Garrano wild horse in the north of Serra do Seixo eats about 5.5-6.5 kg of gorse (*Ulex sp.*) a day.

Each Garrano wild horse in Serra do Seixo eats between 2007 and 2237 kg of gorse a year.

da administración cos besteiros, se sigan perdendo efectivos e poboacións enteiras de garranos. Os besteiros, propietarios dos garranos salvaxes, defendéronos desde hai séculos de furtivismos e de roubos polos cuatreiros. Eles son os artífices da conservación deste magnífico representante da nosa fauna (BAS, S. & SÁNCHEZ-CABEZUDO, M. 2016).

A Margarita, polo seu ánimo e ocasional compañía nas visitas á serra do Seixo e a Sabela Pérez pola tradución do texto.

The population of 360-380 Garrano wild horses in Seixo eats about 722.5 to 901 tonnes of gorse (*Ulex sp.*) a year within the 3,400 hectares of mountain they live in, without taking into account the seasonal foals that also live there.

The vegetable landscape of Serra do Seixo is shaped by the Garrano wild horses. They are the key herbivore. Besides they are the best preventive measure against forest fire.

These simple data should make Autonomous and Government Administrations abandon their penalty policies against Garrano wild horses (decree of equine identification 142/12 of 14th June, 2012) in order to take measures to preserve this key herbivore representative of Galician wildlife.

It would be terrible that individual horses and whole populations of Garranos might be lost due to the lack of communication between the Government and the Garrano owners. Besteiros, the owners of Garrano wild horses, have protected them from poaching and theft by horse rustlers for centuries. They are the authors of the conservation of this magnificent representative of our fauna (BAS, S. & SÁNCHEZ-CABEZUDO, M. 2016).

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## BIBLIOGRAFÍA

- BÁRCENA, F, 2012. Garranos: os poneis selvagens (*Equus ferus sp*) do norte da Península Ibérica. Actas 1 Congreso Internacional do Garrano. Candidatura a Patrimonio Nacional. ATHACA. Vila Verde. Pp: 75 – 96.
- BAS, S. 2014. Sociabilidade e hábitat dos rebezos (*Rupicapra pyrenaica parva*, Cabrera, 1914) nun sector de Picos de Europa. Braña, Boletín científico SGHN, 12: 1-17.
- BAS, S. 2016. Censos de macromamíferos de monte en tres serras de Pontevedra. Braña, Boletín científico SGHN, 14: 9-23.
- BAS, S. 2016. Dieta dos lobos dunha parte de Pontevedra: selección de presas e conservación. Braña, Boletín científico SGHN, 14: 29-45.
- GARCÍA, R.R.; JÁUREGUI, B.M.; GARCÍA, U.; et al. 1979. Effects of livestock breed and grazing pressure on ground – dwelling arthropods in Cantabrian heathlands. Ecol. Entomol., 34: 466 - 475.
- GUITIÁN, J.; DE CASTRO, A.; BAS, S.; SÁNCHEZ CANALS, J.L. 1979. Nota sobre la dieta del lobo (*Canis lupus L.*) en Galicia. Trab. Comp. Biol., 8: 95 – 104.
- IGLESIA, P.J., 1973. Los caballos gallegos explotados en régimen de libertad o caballos salvajes de Galicia. Tesis doctoral. Univ. Complutense, Madrid. 1205 pp.
- LAGOS, L., 2013. Ecología del lobo (*Canis lupus*), del poni salvaje (*Equus ferus atlanticus*) y del ganado vacuno semiextensivo (*Bos taurus*) en Galicia: interacciones depredador – presa. Tesis doctoral. Univ. Santiago de Compostela. 458 pp.
- LÓPEZ BAO, J.V.; SAZATORNIL, V.; LLANEZA, L.; RODRÍGUEZ, A. 2013. Indirect effects on heathlands conservation and Wolf persistence of contradictory policies that threaten traditional free – ranging horse husbandry. Conservation letters 00, (2013): 1-8.
- LLANEZA, L. 2016. Lobos en ambientes muy humanizados del N.OE. de la península ibérica. Tesis doctoral. Univ. Santiago. 186 pp.
- MAGDALENA, R., VIDAL, T., 1987. Los garranos galaicos son un testimonio viviente de los antiguos caballos salvajes de Iberia. Quercus, 15: 35-38.
- MOSQUERA LOSADA, M.R., 2013. O papel do cabalo salvaxe na redución da biomasa forestal e o risco de incendio. Actas 1º Congreso Galego Cabalo Salvaxe. Rábade - Lugo. 26 pp.
- RIGUEIRO RODRÍGUEZ, A.; LÓPEZ DÍAZ, M.L.; MOSQUERA LOSADA, M.R. 2004. Responses of main shrub species to different grazing regimes in Galicia. En: Towards the sustainable use of Europe’s forests. Joensuu, Finland. pp.: 301 – 307.
- RIGUEIRO RODRÍGUEZ, A.; MOSQUERA LOSADA, M.R.; ROMERO FRANCO, R. et al. 2005. Silvopastoral systems as a forest fire prevention technique. En: Proceedings of an Int. Congress on Silv. And Sut. Manag. Univ. Santiago de Compostela – Lugo: 380 – 387.
- RIGUEIRO RODRÍGUEZ, A.; SANTIAGO FREIJANES, J.J.; MOUHBI, R. et al. 2013. Sistemas silvopastorales en prevención de incendios en Galicia: red de experiencias piloto de transferencia de tecnología. Univ. Santiago – Lugo. 7 pp.
- SAZATORNIL, V. 2008. Alimentación del lobo (*Canis lupus L.*) en zonas del occidente de Galicia con presencia de ganado equino en régimen de semilibertad. Memoria de los cursos teóricos del programa de doctorado en Biología. Univ. Coruña. 78 pp.
- XUNTA DE GALICIA. 2012. Decreto 142/2012, do 14 de xuño, polo que se establecen as normas de identificación e ordenación zoonosanitaria dos animais equinos en Galicia. D.O.G. , nº 129, 6 de julio, 2012.