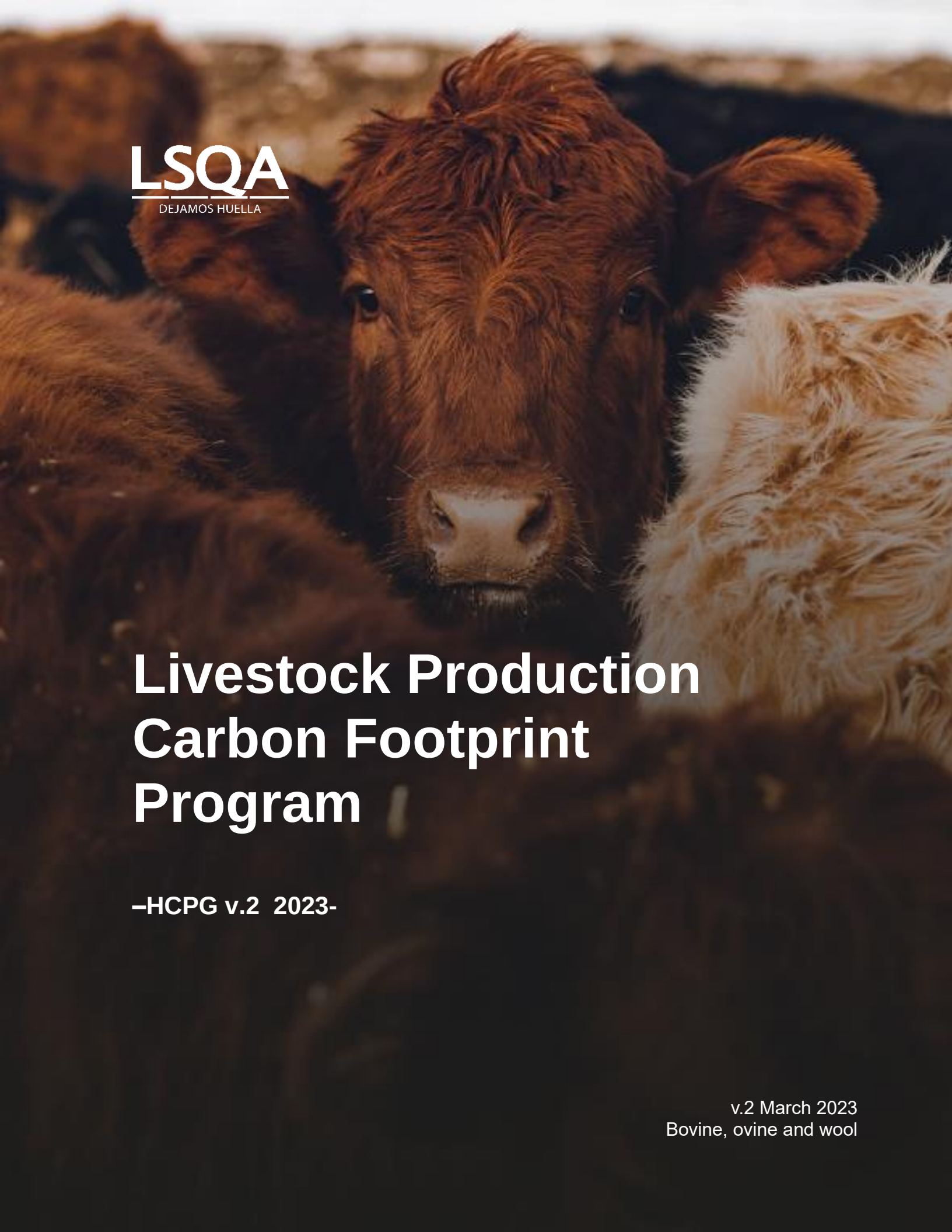


LSQA
DEJAMOS HUELLA

Livestock Production Carbon Footprint Program

–HCPG v.2 2023-

v.2 March 2023
Bovine, ovine and wool

INTRODUCTION

The Intergovernmental Panel on Climate Change (IPCC) published its sixth assessment report in March 2023. Some of the results reinforce the global importance of the Agriculture, Forest, and Other Land Uses -AFOLU- sector, particularly livestock production, due to the potential impact of its activities on climate phenomena and the effect of these phenomena on specific animal protein production processes. In this sense, the increase in food production costs due to prolonged droughts or significant variations in rainfall periods and intensity stands out.

Some warning signals trigger livestock production and value chain, reflecting on insurance premiums costs. This risk affects different aspects of sustainability, with food security being a remarkable one.

The productive efficiency of a farm depends on different variables, not all of which are internally controllable, such as droughts and consequent periods of water scarcity. These undoubtedly require effort in the development and implementation of adaptation measures.

Other variables, however, respond to internally controllable factors by the producer. Among them are those practices that have a mitigating effect on the potential impact of production on climate change phenomena. These practices naturally result in better utilization of the organic matter of plant food, either by improving the genetics of plant species, cultivation, and irrigation practices or by optimizing and using natural fertilizers. The latter results in a potential reduction in the formation of nitrous oxide (direct and indirect). The same applies to the genetic potential of animal breeds, their potential for converting food into energy, resulting in weight gain in less time and reduced waste. This waste reduction precisely leads to fewer methane emissions in enteric fermentation.

In addition, there is scientific evidence, resulting from increased research in recent years, regarding the behavior of soils as sinks. In Uruguay specifically, there are representative data on the main grazing systems with agricultural exploitation in managed pastures.

This availability of evidence and calculation methods, verifiable and evident within the framework of accredited conformity assessment instruments (evaluation standards under the umbrella of ISO 17029), sets the appropriate stage for developing a program such as LSQA's HCPG.

HCPG is a requirements scheme under the life cycle approach with measurable and evaluable scope. Its purpose is to guide and point the way for producers who want to impact shared objectives with the international community positively. An instrument to know, improve, and communicate the performance of livestock production systems regarding their potential impact on climate change phenomena.

This document details the program principles, the eligibility and reporting requirements, the conformity evaluation criteria, assessment procedures, and the management guidelines for the certification mark of the GHG inventory results. It contains eight sections.

The first section clarifies basic concepts for contextualizing and understanding the requirements and criteria.

The second section explains the principles that serve as the foundation for the program's requirements and the general processes to get started and then evaluates conformity that will allow access to some recognition.

The third and fourth sections detail the specific requirements for quantifying emissions and removals.

The fifth section presents the additional requirements for conformity related to specific conditions of production systems and the quality and control of data used for reporting.

Part six presents the verification process of the carbon footprint following ISO 14064-3 under ISO 17029 scope, with ISO 14065 and HCPG as guiding programs.

Part seven complements the above with requirements for additional recognitions, and part eight clarifies the references of mandatory requirements for chain of custody management and the use of logos and certification marks (labels).

Part I – Context of the Carbon Footprint in Livestock Production Systems

1.1. Carbon Footprint

The Carbon Footprint is a numerical value that indicates the potential impact of a process, operations, product, or services on climate change-related phenomena. This indicator is evaluated throughout the product's life cycle, considering its production, distribution, consumption, and final packaging.

The numerical value reported in the indicator refers to the amount of greenhouse gases -GHG- emitted into the atmosphere during the product's life cycle. To be aggregated into a single value, the mass of all emitted gases has been converted to their equivalent in CO2 and reported per unit of product.

1.2. Uruguayan Livestock Production

Animal protein production is one of the activities with a long trajectory in human history. Beyond contributing to food security, the efficiency in converting plant-based food into proteins of higher nutritional value fueled the expansion processes in the sector with consequent positive impacts on the economic and social spheres.

In terms of environmental impact, animal protein production is a conversion process that begins under anaerobic conditions (the ruminant's stomach), suitable space for the fermentation of organic matter, and the consequent generation of methane gas, one of the GHGs identified in the Kyoto Protocol as causing impacts on climate change.

In Uruguay, livestock production represents 4% of the national GDP, developed with the best practices and state-of-the-art managing agricultural systems. The 100% traceability system of livestock is a pioneer in the region and the basis for recognizing different internationally accredited protocols.

There are different styles of production, traditional low-density livestock farming on managed grasslands can coexists with intensive feedlot finishing systems.

The Uruguayan livestock production system aims to minimize the fattening time; therefore, the raw material spends less time than the world average, converting plant-based food into protein.

At the same time, extensive livestock farming on managed grasslands and soils, not balanced in carbon content, provides potential carbon sequestration thanks to the high efficiency in obtaining dry matter during crop rotation in four-year schemes.

This framework of livestock activity has promoted the interest of productive sectors in better understanding their reality in terms of impact on climate change phenomena and the competitiveness of the production system.

In this context, the Carbon Footprint indicator provides the appropriate tool for the producer to know their impact and communicate their results to the interested consumer.

1.3. Livestock Production, Carbon Footprint and LSQA

LSQA is an international accredited verifier/validator of GHG within the ISO standards governing the family of environmental declarations.

To verify inventories, LSQA developed a reference program for the livestock production sector. This document details guidelines and criteria whose compliance promote practices oriented towards reducing the impact on climate change.

The producer's acceptance of the program indicates that their activities follow a trajectory that leads to low-carbon or carbon-neutral production. However, it also provide a tool that guides the producer to gradually expands the spectrum of their reports to incorporate elements that refer to sustainability as a whole.

1.4. Technical framework and references

a) The Livestock Production Carbon Footprint Program uses the latest declarations published by the Intergovernmental Panel on Climate Change (IPCC) as its base reference.
b) It recognizes the GHGs indicated in the Kyoto Protocol (KP) and the ozone-depleting substances identified in the Montreal Protocol (MP).
c) Accept emission factors under the selection criteria proposed by the IPCC. One valid reference in Uruguay is the biannual report of the National Inventory of Greenhouse Gases (INGEI), published by the National Agency for Environmental Affairs (MINAMB) and publicly available on the official website.
d) To incorporate emissions values from raw materials, LSQA recognizes and accepts carbon footprint values reported officially by Uruguay sectoral organizations. In addition, this program recognized values published in academic articles, peer-reviewed journals, and commercial databases; however, the producer must describe, explain, and justify their representativeness to the product system. In all cases, the verification team evaluates the pertinence of the data and references used to elaborate the inventories. LSQA can accept them if their use within the reporting doesn't result in a substantial discrepancy when comparing with the results

following IPCC guides or INGEI guides, according to the materiality criteria of the HCPG. The National Institute of Agricultural Research (INIA) periodically publishes a "Consultation Manual - Emission Factors and Coefficients for Carbon Footprint Studies in Uruguay: LIVESTOCK SECTOR."

e) Calculation methods for the distances traveled in freight transport must consider the average reference autonomy of the sector in the transport area.

f) LSQA periodically includes and adjusts default references for specific data and sources of emissions and publishes them in updated versions of the HCPG Program Document, identified with the suffix v.n, where n refers to the version number. This one is the HCPG v.2 2023. The use of different references or values must be explained and justified.

1.5. Report following ISO 14067

When a producer follows 14067 for product carbon footprint (total or partial), the calculation and reporting must also comply with the requirements of a Product Category Rule (carried out under the ISO 14027 standard or equivalent). Then, depending on the resulting value, LSQA issues an ecolabel with the related verified environmental declaration.

1.6. Report following ISO 14064-1

When a producer decides to report following an organizational perspective with 14064-1, he must follow the last version with the life cycle approach (2019) and conducts exhaustive identification of emissions sources -at least category 5 (see 6.2 consolidation approach ISO 14064-1 2019). In addition, the producer must follow the Carbon Pass Program C.P.v.1 2023 for specific guidelines to allocate verified net balance to the sold products and forward information to the next stage in the value chain.

1.7. Verification process framework

To verify the GHG inventory for the two options described above, LSQA develops and executes an evaluation plan following ISO 14064-3-2019, 14065-2015, and 17029.

1.8. Competencies of the verification team

The verification team pursuing the assessment must comply with the competencies qualification process according to the system's scope to be verified. LSQA holds an accreditation on ISO 14066 for the accomplishment of this qualification.

PART II - 2. GENERAL PROCEDURE AND PRINCIPLES

2.1. General Procedure

2.1.1. Admission application

a) The producer requests the admittance into the HCPG program by fulfilling HCPG/A v.1 2023 formulary, available at LSQA website, attaching the evidence required to evaluate compliance with the eligibility criteria described in section 2.2.4.1.

b) LSQA will assign a sales executive and technical assistance to resolve any doubts that arise during the application stage. Participating in the program is free of charge.

c) LSQA evaluates the application and communicates the decision to the applicant via email, and if accepted, issues an Acceptance Letter to the Program – HCPG/AL v.1 2023.

d) Since the acceptance letter issuance date, the producer has one year to complete "Task One," which involves submitting a greenhouse gas inventory verified by a third party, which can be a service provided by LSQA.

e) The technical-commercial proposal, issued by LSQA – HCPG/PC v.1 2023, defines the verification/certification services; when accepted by the producer, it constitutes the Work Agreement that encompasses all verification, certification, and supply chain monitoring services and activities.

2.1.2. Reporting

a) The producer prepares a document with the GHG inventory according to ISO 14067 and a PCR or ISO 14064-1 (2019) (see 1.5 and 1.6 in section I), including all HCPG requirements specified in this document's third and fourth sections.

b) LSQA does not participate in calculating nor reporting the inventory and carbon footprint to be verified. To acquire the technical skills needed to face the reporting activity, LSQA provides general courses annually to all interested public. (Visit LSQA Academy for additional information https://lsqa.com.uy/LSQA-Academy/Capacitacion-2022/Programas-2023)

2.1.3. Verification/Certification

a) LSQA verifies the inventory under ISO 1464-3 (2019), 14065 (2017), and evaluates the conformity with the specific requirements detailed in this document for the certification of the process according to its performance, measured with the final verified value of its carbon footprint per Kg of live weight (ISO 17065). More detail is provided in 2.1.1, 5.3 and section VI.

b) This document also details the allocation rules for each type of production system in section 3.10. These allocations rules are mandatory if the reports and consolidation method goes by ISO 14064-1 (2019). If the producer reports by ISO 14067 he must follow the allocation rules of the PCR selected, procedure described in section 3.11.

2.1.4. Labeling

a) Once the environmental declaration has been emitted, LSQA allows the issue of a label for the packaged final product, complying with the ISO 14026 standard for preparing Type III eco-labels.

b) If the producer does not pursue the program under ISO 14067, then the label on the product is not an eco-label, and there is no final environmental declaration. In this case, following 17065, the producer obtained a certification mark with the

performance achieved, for the process category of livestock production, concerning their potential impact on climate change.

c) In both cases, the producer receives a plain label informing a verified process feature (Carbon Footprint; Low Carbon or Neutral Carbon, see 2.2.2 below in this section).

d) The difference consists in considering the first case as the verification of an environmental declaration of the product. In the second case, the feature verified is considered a measurable process attribute; therefore, the products are certified as being produced with this attribute.

e) The producer must use the eco-label or certification mark following the user guidelines (HCPG/E v.1 2023).

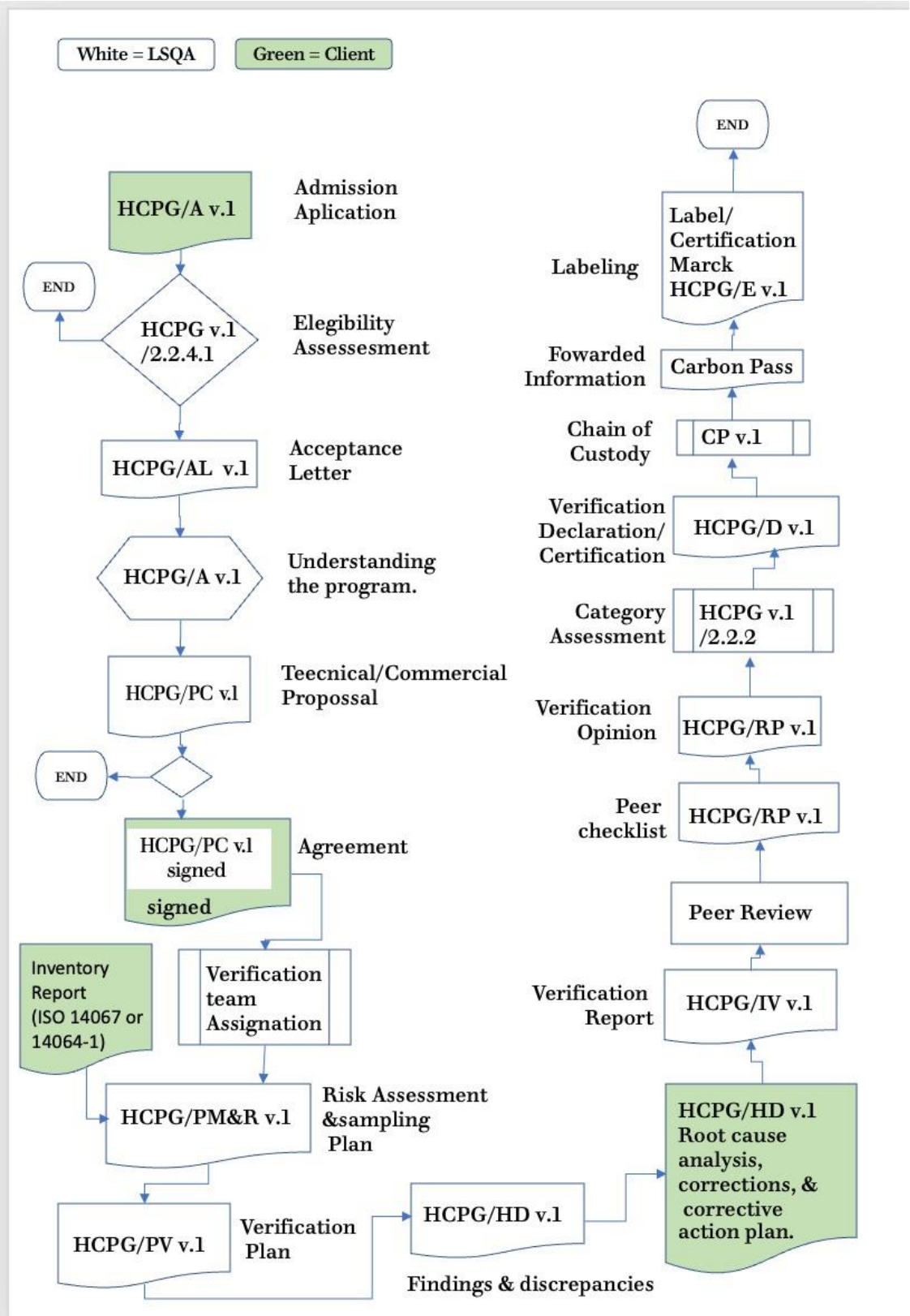
f) The information regarding the value of the carbon footprint will be forwarded to the next stage in the value chain via the Carbon Pass, issued each time the producer requires that the slaughterhouse use the eco-label or the certification mark on the final packaged product (Chain of Custody Program CP v.1 2023)

2.1.5. Continuous Improvement Goals.

The producer proposes LSQA improvement goals for subsequent evaluation. This goal can be GHG reduction, compensation, or even incorporating a new environmental impact category in its life cycle analysis and assessment.

Figure 1 shows a diagram flow of the quality plan for verifying the livestock production carbon footprint (stage one) and to assess the conformity with HCPG v.2 2023 additional requirements for performance recognitions (stage two).

Figure 1: Quality Plan Flow



2.2. Principles

2.2.1. Producer Accountability

The producer participant in the LSQA HCPG program assumes the commitment to:

a) Comply with all the requirements established in this document.

b) Comply with all the requirements established in the Product Category Rule -PCR- if reporting following ISO 14067 2019. As was set before, the producer shall select a specific PCR developed under the ISO 14025:2006, ISO 14040:2006, and ISO 14044:2006 standards by a qualified expert team.

c) Comply with the regulations for labels and symbols established by LSQA in HCPG/E v.1 2023, seeking to communicate their environmental declaration or certified performance transparently and avoiding any potentially misleading use. In case of non-compliance, LSQA will take the necessary measures, including withdrawing recognition.

d) Comply with all the requirements and legally applicable regulations in the country where it operates. LSQA will request evidence of current official authorizations and permits as part of the verification process.

e) Allow LSQA access to the system-product facilities and the documentation necessary to evaluate compliance with the requirements established in this document.

f) Keep five years the documentation supporting the verified declaration.

g) Notify LSQA, within a period not exceeding 120 days of any changes that alter the declaration, such as increasing production volume, system boundaries, among others. LSQA will evaluate the impact on the verified results.

h) Request the issuance of a carbon pass, according to CP v.1 2023 when using labels on the product after slaughter activities. The carbon pass forwards verified carbon footprint information to the slaughterhouse and from them to the dealer who buys a final packaged product with the label on it. To update and keep valid records, of the certified product stock available, for further transactions. LSQA will use:

i. Public data from the National Livestock Traceability System (SNIG https://www.snig.gub.uy/principal/snig-principal-trazabilidad-trazabilidad-grupal-prueba) to cross-verify the transaction reported in the carbon pass (in live weight Kg)

ii. Default values for slaughtering and transportation emission (National GHG Balance Inventory of Uruguay) or actual values from the slaughterhouse if it belongs to the integrated program of livestock system (HCIP&O v.1 2023) or has a third party verified carbon footprint.

iii. Actual data from programed Chain of Custody audits to the slaughterhouse, if solicited by the slaughterhouse.

2.2.2. Recognition based on evidence and valid scientific criteria.

The HCPG v.2 2023 establishes four recognition categories linked to the verification process results (section 2.1.) To access them, the organization must comply with the requirements in the third and fourth section of this document.

a) Category I: Carbon Footprint Verified

The producer who reports their carbon footprint inventory following the HCPG v.2 2023 , and the verification process results in a favorable opinion of conformity, receives the certification of "Carbon Footprint Verified." This mark means there were no substantial discrepancies between the declaration provided by the producer with its GHG inventory and the results obtained by verification team following HCPG v.2 2023 guidelines and procedures. In addition, the level of assurance requested for verification must be reasonable, and the materiality agreed with the producer must be equal to or less than 5%.

This producer may also apply for category II, III, or IV, depending on the verified numerical results of the Footprint indicator reported in kg of CO2 eq/kg live weight.

b) Category II: Low Carbon Verified

The producer receives this additional certification when, in addition to all other requirements of this program, the absolute value of the emissions and removals balance of the verified inventory results, at least, 10% lower than the Livestock Carbon Footprint value officially reported at the country level -HCGU-, without considering the contingent of removals blocked by uncertainty and fluctuation insurance -SIF-,(see 2.2.3.1) In other words, the result must be at least (10% + %SIF) lower than the HCGU value for the year of the report.

For example, if

- HCGU value, officially reported in Uruguay, for the year of the reporting activity is HCGU = 18 KgCo2 eq/Liveweight Kg and

- Production system verified emissions = 20 KgCo2 eq/Liveweight Kg and

- Production system verified removals = 12 KgCO2eq/Liveweight Kg, then

- the net balance is positive = 6 KgCO2eq/Liveweight Kg, This value is 10% below HCGU.

However, to be considered for the Low Carbon certification, the producer must discount a percentage of the verified removals previously defined in the initial agreement -HCPGPC v1.2023, .(see 2.2.4.1 d). In the example presented above, if the SIF is 15%, then the producer must report their balance as follows:

- 18- (0,1x18) = 16,2 KgCo2 eq/Liveweight Kg is the top value allowed to be certified as Low Carbon Production (10% threshold of the local media)

- 20 - (12- (0,15x12)) = 9,8 KgCO2eq/Liveweight Kg. (Net real balance Emission – Removals, considering 15% SIF)

- In this case, the value is still below 10% of the HCGU, and then, if the producer complies with all other requirements of this document, their production is certified Low Carbon Verified.

The HCGU is a value monitored by LSQA and confirmed during the initial verification agreement.

c) Category III: Carbon Neutral Verified

The producer receives this additional certification when, in addition to all other requirements of this program, the absolute value of the emissions and removals balance of the verified inventory yields negative. This negative value must result from the balance without considering the contingent of removals blocked by uncertainty and risk insurance -SIR-, see 2.2.3.2. In other words, the result must be less than (0-%SIR).

For example, if

- Production system verified emissions = 16 KgCo2 eq/Liveweight Kg and
- Production system verified removals = 21 KgCO2eq/Liveweight Kg, then
- the net balance is negative = -5 KgCO2eq/Liveweight Kg.

However, to be considered for the Carbon Neutral certification, the producer must discount a percentage of the verified removals previously defined in the initial agreement. For example, in the case presented above, if the SIR is 20%, then the producer must report their balance as follows:

- 16 - 21 - (0,20x21) = 16 -16,8 = -0,8 KgCO2eq/Liveweight Kg. (Net real balance Emission – Removals, considering 20% SIR)

In this case, if the producer complies with all other requirements of this document, then the production is certified Carbon Neutral.

d) Category IV: Additional Recognition

The additional recognition (see Part VII of this document) applies to the organization incorporating verifiable impact indicators or materials improvements in sustainability. These other practices must follow the requirements of the specific scheme chosen by the producer, such as Water Footprint (ISO 14046 - HA LSQA Scheme, EPGAS LSQA, among others). The details and specific requirements of each of these instruments are beyond the scope of this document.

2.2.3. Conservative approach

2.2.3.1. Uncertainty and Fluctuation Insurance -SIF-.

The HCGU, as defined in 2.2.2 b), is not a fixed value over time. In this sense, producers accept that it may vary depending on sectorial expert knowledge, affecting the maintenance of the recognition received. For this to occur, the new criteria to modify HCGU value must have been published and validated by the same official body that issued the previous one. If the change occurs after the verification and issuing the recognition certification mark, the impact affects the following year's production after the modification, when the difference will be considering.

This program stablishes additional requirements to manage the risk of issuing a Low Carbon certification to a production system that could be no Low Carbon under new conditions of references, not predictable for the mandatory sensibility analysis of the report, described in 3.4.12. The producers accept that a fraction of the verified removals remains blocked and unaccounted for net GHG balance as a -SIF-. This retained fraction provides a mechanism functioning as:

a) Uncertainty insurance: considering a percentage of retention equal to the uncertainty value reported in the verified inventory.

b) Contingent reserve in case the HCGU fluctuates downwards. When this fluctuation occurs, the footprint results may leave the producer outside the Category II thresholds, and the insurance compensates for it. This value is determined based on the data dispersion among the reported national averages in the Mercosur region, Australia, and New Zealand and registered in the LSQA document for Referent Values (RV): HCPG/RV v.1 2023.

2.2.3.2. Uncertainty and Risk Insurance -SIR-

Producers accept that a fraction of the removals remains blocked and unaccounted for -SIR-. This retained fraction provides a mechanism functioning as:

a) Uncertainty insurance: considering a percentage of retention equal to the uncertainty value reported in the verified inventory.
b) As a contingent reserve in case the source of removals, or the main activity that generates them, undergoes substantial changes, such as grassland fires

and prolonged droughts. The producer proposes this value as part of the requirements, an input for the risk analysis and it is validated and established in the agreement of services -HCPG/PC v.1 2023

2.2.4. Responsible accompaniment

2.2.4.1. Eligibility, the entry-level and first task

The organization communicates LSQA the intention to participate into the HCPG program, and LSQA assesses the evidence provided to confirm the following eligibility requirements:

a) National Legal Compliance
b) All livestock is produced through the same process within the limits of the establishment. If there are different types of operation (i.e., breeding and feedlot), the Producer must provide evidence of control for the specific data of the activity for each one (accounting for fuel, electricity, fertilizer, feedstock, and all significant consumptions, including the purchase of living animal to fattening and termination)
c) Livestock traceability system (100%)
d) Rotational grazing in managed grassland (if the Producer aims to report organic carbon sequestration in managed soils)
e) Soil under non-carbon equilibrium conditions (if the Producer aims to report organic carbon sequestration in managed soils)
f) Low-density grazing (0,8 head/ha or lower) (if the Producer aims to report organic carbon sequestration in managed soils)
g) Ownership or long-period contract (more than five years from the data of the verification) of the land where sequestration of carbon occurs. if the Producer aims to report organic carbon sequestration in managed soils)
h) Forest with no commercial use. If the organization commercially produce the forest, then all the activity will be considered for the balance, inclusive the impact for the destination and use of the product. (If the Producer aims to report biomass carbon sequestration in forestlands)
i) No Land Use Change since December 2021

j) Other certifications and practices, not mandatory, but considered a desirable plus and a trend to be incorporated in oncoming years:

- Grass-fed
- Natural -INAC
- Organic -USDA
- Animal Welfare
- Certification of compliance with Aboriginal People Rights for Land Use
- Deforestation Free certification of supply chain.
- No infant labor guarantee.
- ESG reports
- Management System Certification (i.e ISO 9001, 14001)

If the assessment results are favorable, LSQA communicates it to the Producer with an Acceptance Letter -HCPG/AL v.1 2023.

The Producer is then considered in "Entry Level" and must accomplish Task One: The verification of its GHG inventory for emission and removals of the production establishment (Categories 1-5 Cradle to the farm gate, ISO 14064-1 or ISO 14067 Partial Carbon Footprint Cradle to farm gate with an specific PCR).

The Producer has one year counting since the acceptance letter to fulfill this first requirement. If the verification process results in no favorable conclusion, the Producer can ask for an extension of 180 days to resolve the substantial discrepancy and obtain a verified report of GHG.

2.2.4.2. Efficiency based recognition.

LSQA promotes the disclosure of best practices and believes that certified production efficiency results, specifically regarding environmental performance, are an excellent tool for organizations to showcase and communicate their strengths. Based on the principle of efficiency, LSQA recognizes those producers whose verified net GHG balance results fall into a particular category, as described in section 2.2.2. The Producer must use the certification mark over each lot sold following the guidelines of this document and after LSQA have issued the related carbon pass, with an audited chain of custody at the destination establishment.

2.2.4.3. Voluntary guidelines

The HCPG constitutes a voluntary set of guidelines presented as scheme with specific requirements. Participate in the program is free of charges. Nevertheless, of If an organization decides not to continue participating in the program, and later decides to rejoin, it will be considered a new proponent. Therefore, it must pass through the eligibility assessment and task one for the entry level; regardless of the duration of the organization's involvement in the program or the stage of the reporting cycle at which it left the program.

2.2.4.4. Continuous Improvement

LSQA promotes continuous improvement in livestock production practices, specifically those that could reduce the potential impact on climate phenomena and serve as an initial step towards sustainable livestock management.

The evaluation cycle is five years. Besides the opportunity for improvements that can be developed in five years, there is a technical reason behind the timing decision. Until now, five years is the period for which existing methods for soil analysis are sensitive to variations in organic carbon content in the soil. In this sense, during the period when no measured values confirm the removal, verification assurance is limited, and the parameters of the productive system are verified annually to confirm representativeness of the systems analyzed in the bibliographic sources that underpin the theoretical models of organic carbon removal/sequestration in soil used.

LSQA annually updates the validity of the theoretical models and soil tests used. This update may result in a reduction of reporting cycles. Once LSQA can pursue the verification process, of removals, with a reasonable level of assurance, the Producer has three new options:

a) If the test results show more significant sequestration than reported theoretically and verified under limited assurance in previous years, the producer can reduce his SIR values and compensate for the unquantified removals.

b) If the test result is lower than the verified under limited assurance in previous years, the Producer can use the insurance (see 2.2.3.) or establishes a commitment to compensation goals for the necessary values.

c) Reduce or increase the insurance quota to verify the five years of the second evaluation cycle.

PART III - REQUIREMENTS RELATED TO QUANTIFICATION OF EMISSIONS

3.1. Sources

The HCPG Program assumes that GHGs are emitted and removed throughout the life cycle of a system product, from production and acquisition of raw materials, production of living protein, land use, transportation, delivery, use, and end-of-life treatment. Therefore, quantifying and reporting Carbon Footprint requires identifying all sources of Green House Gasses -GHG- throughout this system-product cycle. Agricultural production systems emit different types of GHGs, mainly CO2, CH4, and N2O. There may also be the presence of CO, VOCs, NOx, and SO2.

3.1.1. The producer must select all systems models representing all the operations to be included in the GHG inventory to be verified.

Figure 2. a

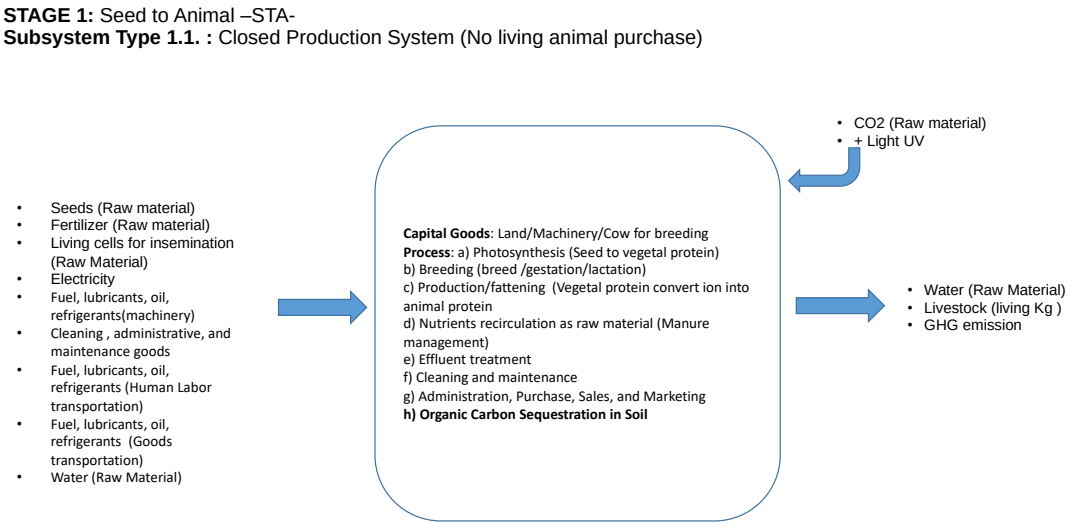


Figure 2.b

STAGE 1: Seed to Animal –STA-
Subsystem Type 1.2. : Open Production System (Living animal purchase)

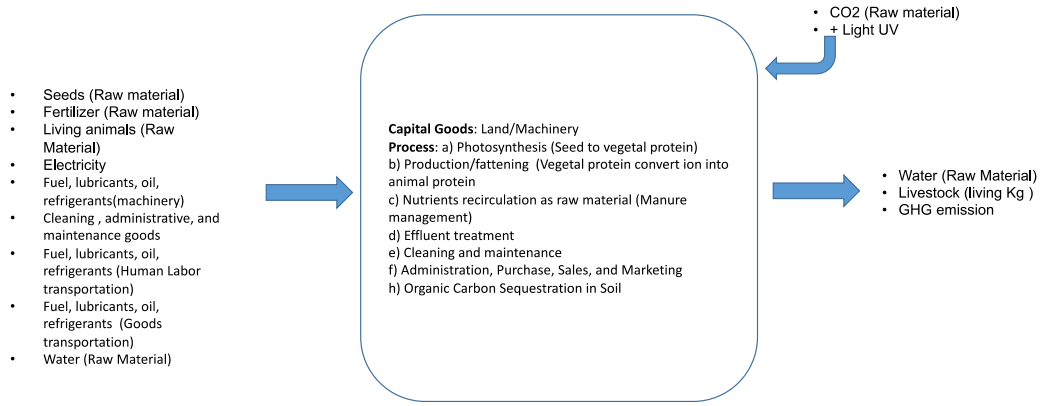
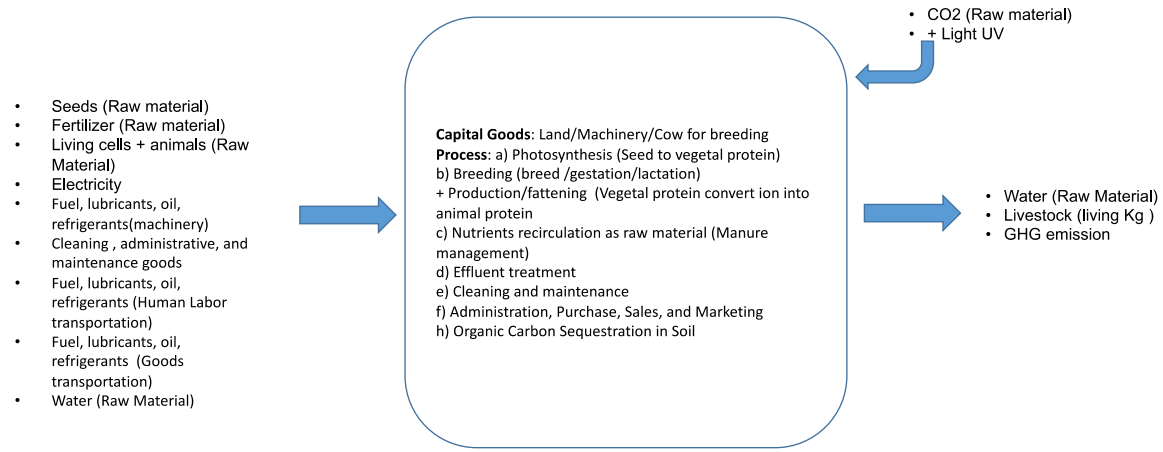


Figure 2.c

STAGE 1: Seed to Animal –STA-
Subsystem Type 1.3. Hybrid Production System (Breeding + Living animal purchase)



3.1.2. The sources can vary between types of systems-products, therefore, for its participation in the HCPG program, the producer must identify, for its system type, all sources of the following gases in all processes of the life cycle indicated in figures 2. a, 2. b, or 2. c, depending on the producer's system type:

- Carbon dioxide, CO2
- Methane, CH4
- Nitrous oxide, N2O
- Non-methane volatile organic compounds, NMVOCs
- Nitrogen oxides, NOx
- Sulfur dioxide, SO2
- Perfluorocarbons, PFCs
- Hydrofluorocarbons, HFCs
- Sulfur hexafluoride, SF6
- Nitrogen trifluoride, NF3
- Hydrochlorofluorocarbons, HCFCs
- Chlorofluorocarbons, CFCs

3.2. Guidelines for the application of reporting standards

3.2.1. Standards

The Producer must develop and report the Inventory of all significant GHG emissions and removals associated with the system product according to 3.1 and choose one of the following routes:

a) Report following ISO 14067:2019 standard and complies with the specific referenced PCR requirements.
b) Report following ISO 14064-1:2019 standard and complies with the additional requirements for cut-off d assignations rules in section 3.11. of this document.

3.2.2. Intended user.

For the verification process of either ISO 14067:2019 standard or 14064-1, it must be clear that the objective of the Inventory reported is to obtain recognition of the program HCPG v.2 2023. Therefore, the intended user is LSQA, and the interested parties the producer decides to include.

3.2.3. Product Category Rules

PCRs are mandatory when developing environmental declarations and type III labeling. The selected PCR must be valid according 2.2.1. b., so that the evaluation of the final declaration's compliance with the HCPG requirements can result in label recognition.

3.2.4. Certification Mark

When the Producer chooses route 3.2.1. b), it does not require PCR because the conclusion won't be an environmental declaration of the product, but a certification of performance measurable with attributes represented by the Carbon Footprint indicator. The result is a process efficiency certification that can be communicated in a mark of certification (also a label).

3.3. Use of emission factors

a) The source of the emission factors (EFs) must ensure that the development process for these factors considers all relevant life cycle stages (this may require adaptation or modification of an emission factor). The EFs must comply with the requirements established in section 6.3.5, of ISO 14067:2018, and the additional requirements introduced by the PCR. Annex C of ISO 14064-1 provides a complete guide when this approach is selected.

b) The enteric fermentation emission factors of cattle must be from official reports in Uruguay (or the country where the production activity occurs). Nevertheless, the Producer can adjust the original EF to the period his cattle population emits within the system's boundaries. In other words, if the emission factor unit is Kg CH4/per head in a year, the Producer can adjust this factor to the period that the animal stayed in the establishment if it was less than a year. With the same logic, the

Producer must report the carbon footprint of the entire period of production; if it is greater than a year, he must adjust the factor as well, and if he acquired the cattle from outside the boundaries of the system, he must consider the carbon footprint as input of raw material. (For ISO 14067 following the PCR guideline for conversion and allocation factor to the reference flow, and for ISO 14064-1 following consolidation of category 4: indirect emission for goods used by the organization).

c) To calculate the emissions due to the consumption of electricity in Uruguay, the producer must use emissions factors provided by the National Interconnected System of Uruguay (SIN) or by following the steps proposed by an official equivalent entity in the country of origin.

d) If there is not an emission factor available valid source for a particular emission process or GHG, the producer must follow the IPCC latest Assessment Report (AR) guideline to estimate the value.

3.4. Emissions quantification: general guidelines and specifications according to system type

3.4.1. The Producer must identify all sources of emission for the production system within the scope cradle to the farm gate, according to the type of system detailed in Figure 2. a, 2. b, or 2. c.

a) In the case of ISO 14067, the Producer must calculate and report all significative emission, explaining at least 99% of overall inventory. The producer must follow the methodology described in section 6.3, 6.4, 6.5 and Annex E of ISO 14067:2019 and develop an inform of the LCA including all the information detailed in section 7. of the same document.

b) In the case of ISO 14064-1, the Producer must calculate and report all direct emissions and all significative indirect emissions (explaining 99% of overall inventory). The producer must follow the methodology described in sections 5.2 and 6 of ISO 14064-1: 2019 and develop an inform of the LCA including all the information detailed in section 9. of the same document. It is important to note that, for this standard, the limits of the report should not be confused with the organization's boundaries. In the context of the HCPG program, the report

boundaries are those established in the diagrams for each type of production system (Figures 2a, 2b, and 2c).

3.4.2. System Type I: Exclusively Breeding livestock.

a) Emissions from the six-month lactation period of the calf can only be disregarded if the inventory includes emissions from the lactating cow during the same period. Theoretically, the calf under six month or until weaning, has not ruminant functionalities developed, therefore there is not enteric fermentation yet, but the breeding cow has emission to be quantified because they are related to the breeding process. Sometimes it is difficult to provide registered evidence of the number, age and feeding process of the cows, and the verifiable information for the cattle population in a farm is from calves to mature and sold cattle. Then, applying a conservative approach, the producer must report enteric fermentation emissions of the animals since birthday, not after six month, an then compensate the missing data of the cow.
b) The Producer must report the activity value from a population census, -determining the reference flow for ISO 14064-1-, and the emissions from enteric fermentation and manure management. The Producer must base the values on a verifiable traceability system and calculate the population average following equation 10.1 IPCC Chapter 4.

3.4.3. System Type II: With Purchased livestock for rearing, fattening, or finishing.

a) The emissions quantification from birth to entry into the declared productive establishment must include the verified carbon footprint value from the supplier.
b) If this value is unavailable, it must consist of the most recent country average footprint value used as a reference, a value published by a national agency, or the latest published nationwide GHG inventory. This value can coincide with HCGU as defined in 2.2.2 b).

3.4.4 System Type III: Hybrid System with Purchased Livestock and Breeding

a) The Producer must consolidate inventory data for each process separately and select a model representing the mass and energy relation between them if he applies for an integrated certification.
b) The producer can report the inventory for specific production system, but it must always be an entire establishment. In other words, the Program prohibits cutting off livestock production if it occurs in the same location or establishment that is reporting the inventory. However, it is allowed to report one establishment of many in different geographical areas. LSQA issues the certification mark and controls stock with a carbon pass issued only for the production of the evaluated establishment.

3.5. Consolidating Carbon Footprint: Global Warming Potential

3.5.1. To convert the GHG emissions and removals to emissions and removals of CO2 eq., the producer must use the Global Warming Potential (GWP) value reported in the latest IPCC Assessment Report.

3.5.2. In addition, the Producer can report results with parameters such as the Potential Global Temperature Change (GTC), quantified according to the values reported in the latest IPCC Assessment Report.

3.5.3 The additional results of 3.5.2, are also subject to verification to assess the conformity of the resulting environmental declaration. However, LSQA only recognizes those values obtained with the GWP for certifications under the criteria of the HCPG Program.

3.6. System Boundaries

The HCPG program focuses on animal protein production, from cradle to farm gate. The boundaries of the production system are the same physical limits as the farm's, including the emission and removals on the upstream value chain.

3.6.1 When following ISO 14067 standard, the available PCR considered the slaughterhouse a core process. According to expert consensus, the livestock production system in its upstream stage, is where occurs between 75% -80% of the total emissions of the meat product.

The approach of the HCPG Program is to focus on Livestock production as a core process. For that reason, producers must identify all the emissions and removals of their own upstream process: grassland management, cultivation, feedstock production, and the use and production of all related goods (fertilize, chemicals, herbicides, cleaning), services (electricity, transportation, maintenance, and sales).

The core process is the animal protein production from dry vegetal matter produced at upstream. However, the upstream described above sometimes coincides with the core process, for example, when the systems operate as grazing in managed grasslands under exclusive grass-fed production. The core process must include all raw materials, inputs, operations, and services until the animal leaves the establishment. This exhaustiveness implies that the Producer must consider the carbon. Also implies additional requirements regarding the quality of data collected for the inventory. All production data must be specific, including activities such as raw material quantities for feedstock production and their transportation to the facility (see section 3.8 of this document).

3.6.2. When following ISO 14064-1 the producer must establish the boundaries at the physical limits of the organization, including those operation and process within the limits of the defined method for consolidation, following section 5.1 of the document ISO 14064-1:2019.

3.6.3. The Producer is responsible for identifying 100% of the GHG sources within their production system and the boundaries.

3.7. Temporal Limits

3.7.1. Closed Systems

Closed systems exclusively produce meat from breeding without purchasing live animals. In such cases, the production time limit to be verified is calculated based on the year of birth of all sales in the reporting period. For example, if the producer sold three batches, the age of the oldest unit of sale from each batch is checked and assumed as the lifespan of the entire batch. The emissions and removal calculations to produce each batch refer to the period in which emissions and removals occur during its production. The temporal limits for including sales must correspond to the last declared fiscal year (June to July).

a) The producer can adjust the timespan considering one year of emission and removals. It must demonstrate that the production system is stable and do not vary the amount of production of animals nor grassland. The amount of cattle, measured in heads, must be the same each year, with a maximum value of variation no higher than 5%.

3.7.2. Open and Hybrid Systems

Open systems purchase live animals. Hybrid systems also produce meat from breeding. In these cases, the time limit for verifying breeding production is calculated following 3.7.1 if they are separate batches. In the case of hybrid or 100% purchased, it is calculated based on the entry date into the establishment of all units sold in the reporting period. For example, if the producer sold three batches, the oldest purchase date of the units in the batch is checked and assumed as the average for the entire batch.

The emissions calculations to produce each batch refer to the period in which emissions occurs during its production. The temporal limits for including sales must correspond to the last declared fiscal year (June to July). Emissions occurring before that are reported as indirect footprints for purchased raw materials, following 3.4.1.

3.8. Data Type

3.8.1. Producer must collect and report site-specific data for individual processes under declared financial or operational control. In the case of open production systems (where the producer purchases animals, specific data for emissions

occurring in the stage controlled by the producer, i.e., after entry into the establishment, must be used. The preceding stage generates incoming raw material, and data can be obtained from the supplier or estimated using valid reference values (3.4.1).

3.8.2. The producer must demonstrate the representativeness of their production system compared to the system used to obtain any non-specific secondary or primary data.

a) If Producer uses ISO 14067 standard, he must register, explain, and justify a measurable relation between all flows entering and exiting the process with the reference flow. If the Producer aims to report organic carbon sequestration in soil (managed grasslands), or CO2 removals in forest biomass (silvopastoral) with actual data and a Tier 2 approach, he must demonstrate a quantitative relationship between the final product live weight and the CO2 removal or Carbon sequestration.
b) If the Producer can't establish the relation, he must report following the Tier 1 model for Land Use according to IPCC. Nevertheless, he must allocate the flux of removals or sequestration to the feedstock carbon footprint (upstream according to any PCR) or to the activity related to the function of the forest (shadow) into the reference flow (if it is mathematically modeled).
c) The producer following ISO 14064-1 must register and report site specific data of all directs source’s activities occurring within the limits of the establishment. This includes forest and grasslands, regardless their relationship with the core production system.
d) To establish the system boundaries the producer must select all the subsystem present within the limits of the establishment.

3.9. Uncertainty

3.9.1 The producer must consider the requirements related to the uncertainty assessment, as established in section 6.6 of ISO 14067:2019 and 8.3 of ISO 14064-1, to report the Inventory under a conservative approach, as detailed in 2.2.3 above.

3.9.2. The Producer must quantitatively evaluate the uncertainty associated with the values used in selected quantification approaches (i.e., annualized activity data used for inventory quantification). When the quantitative estimation of uncertainty is not possible or cost-effective, it must be explained and justified. Nevertheless, the Producer must estimate and report a quantitative proxy, considering the effect it could have on insurance quotas (see 2.2.3.)

3.9.3. The organization must estimate the uncertainties of each emission, of all removal's sources, and of the total value of the GHG inventory.

$$\boldsymbol{U_i = \sqrt{(EFU)^2 + (AU)^2}}$$

u= uncertainty associated with emission/removal source i.

EFU = uncertainty of emission/removal factor data. This uncertainty value must be from the reference source from which the reporting producer obtained the factor data.

AU = uncertainty of activity data. The producer can estimate this value based on their expert judgment or approximate it to the error associated with direct data measurement. In any case, it must document, explain, and justify.

3.10. Generating a Carbon Footprint indicator based on Organizational Carbon Footprint

3.10.1. If the producer consolidates the inventory of GHG following ISO 14064-1, He must follow the procedure detailed in paragraph a) and b) of this section and in 3.10.2, to allocate the total net value of the farm carbon footprint to the final sell unit.

a) The producer must calculate the net value of carbon footprint according to the procedure and requirements described in sections 3.4 and the fourth part of this document.

b) The producer must ask for third-party verification of the final inventory. If the verification opinion is favorable to conformity with the requirements detailed in

section 3.4 and the fourth part of this program, he can follow 3.10.2. to allocate the value obtained to an unit of sell in Kg. Live weight.

3.10.2. The producer must elaborate and present an annual report of production allocation (ARPA). The verification team will assess this report to confirm compliance with the allocation rules 3.10.2 a), b), and c).

a) The producer must determine the total production and Livestock Composition.

b) The producer must identify the types of livestock produced on the farm (cattle, ovine/sheep, and if there is also commercial production of wool). If the producer does not comply with c) then the wood will not be included as a certificated product.

c) The product from forest commercial use, in the case of silviculture, is considered a direct source of emission/removal, the net value of its carbon footprint is obtained from direct quantification of the activity. Nevertheless, to allocate these results to other products within the farm, there must be a formal mathematical relation between them, if not then the allocation shall not be considered.

d) The producer must keep a register of evidence for the number of produced units per year of each product to certificate. The producer shall not commercially deliver other goods but the declared ones in ARPA for the year.

c) The producer must determine an allocation factor

i. For the case of exclusive cattle production:

- Report and register the total weight of cattle sold over one year.
- Allocate the total verified carbon footprint value by the total weight of cattle sold to obtain the carbon footprint per kilogram of live-weight cattle sold -CFPC-

ii. For the case of producing cattle bovine and ovine

- Report and register the total weight of cattle and ovine/sheep sold as livestock over one year and the specific value of each product.
- The producer must declare an allocation factor using the fraction of weight represented for each product on the total weight sold in the year.

- The carbon footprint of each product sold must be the value obtained using the specific allocation factor declared according to the method described above, in Kg CO2 eq per kilogram of live-weight cattle -CFPC- or Kg of Live weight ovine sold -CFPO-.

iii. For the case of producing ovine, bovine, and wool:

- Report and register the total weight of cattle and ovine/sheep over one year and the specific value of each product.
- Follow the procedure described in ii. to establish the value of the carbon footprint for Kg of live weight ovine- CFPO- and cattle -CFPC
- Determine the weight of wool produced by the weight of the ovine produced.
- Calculate, and verify with third party, all the emissions associated with the additional process required to shear the sheep (following section 3.4 of this document without considering the ovine production): CFPS. Then, divide this value by the total of wool produced over the same year.
- The carbon footprint of wool -CFPW- must be CFPS+CFPO.

3.11. Allocation of emissions within the inventory following 14067

a) The producer following ISO 14067 should avoid, as much as possible, the allocation of environmental burdens in multifunctional processes. System expansion or process subdivision can be methods to apply and prevent it. However, if the producer cannot avoid it, he must justify the procedure based on ISO 14044 2007/ 1:2018 standard and follow the established guidelines in the reference PCR.

b) If the producer consolidates the inventory of GHG following ISO 14067, it must follow the specific guidelines of the PCR selected. The declared unit for inventory quantification is kilograms of live weight. However, the producer may use additional units as a complement and verify them in assessing the conformity of the environmental declaration (carcass weight or animal protein weight). The producer must report the results in kg CO2eq/kg live weight for recognition granted in the program.

3.12. Sensibility analysis

The producer must elaborate and report the results of a sensibility analysis. He must consider the impact of all assumptions, regarding the values and mathematical models of quantification, of the significative sources of emission and removals declared in the report.

PART IV – SPECIFC REQUIREMENTS RELATED TO REMOVAL QUANTIFICATION

4.1. Sinks in Livestock production systems.

Livestock systems generally exist in various configurations according to the processes involved, including rearing, growing, fattening, and finishing. They also vary in feed management: purchasing, cultivating, and processing feed, rational grazing in managed pastures, natural grazing or silvopastoral systems. In addition, each system may have different sinks or none.

4.1.1 The HCPG considers three valid sinks identified in livestock production systems: native forest, planted forest, and grassland soil.

4.1.2. In all cases, the producer must guarantee that there has not been a land use change since December 2020.

4.1.3. The Producer can apply for the verification of a due diligence system for a deforestation-free certification following PDF v.1 2023 requirements.

4.2. Removals in forest production

a) The productive system with a carbon sink in a forest must demonstrate that they are part of the livestock production processes (for example, vegetation walls for shade and shelter). Otherwise, the provisions of b), c), or d) may be followed.

b) If the forest system is not part of the livestock production system, and the producer follows ISO 14067 standards, this removal is materially unrelated to the declared

unit's reference flow. Therefore, the producer must verify by a third party the inventory of the forest system separately.

c) The Offsets units obtained in case b) don't classify as removals for the net balance of the system, and the value is not considered to apply for carbon neutral or low carbon certification.

c) Livestock producers may choose to declare the organizational carbon footprint of their establishment, following ISO 14064-1:2019 and include the forest system, demonstrating that the organization legally owns it. In this case, the forest system is a valid sink with valid annual latent removals of CO2, therefore accounting for low carbon and carbon-neutral certification, if they are not part of an already validated project for verified carbon units. They must conduct the inventory according to ISO 14064-1 and report all emission categories established in 5.2.4. They can justify the exclusion of categories e) and f) of ISO 14064-1. If the forest is for commercial use, the producer must quantify the removals remaining at the establishment, but not those going out in the product (wood), following IPCC guidelines for forest production systems. It is important to clarify that this method implies to consider the emission related with the final use of the wood or good product.

d) Producers opting for the procedure described in c) must a removal inventory following the ISO 14064-1 standard requirements. As in this case, the inventory results do not directly refer to the Kg of product but will be incorporated to the establishment inventory as a whole; the producer must follow the allocation rules described in 3.10 to apply for a carbon neutral or low carbon certification on the livestock products under the scope of this program. The forest product does not receive certification.

4.3. Removals through organic carbon sequestration in soil

When not yet in carbon equilibrium, the soil acts as a sink in forests and grassland under carbon input conditions.

a) The soil organic carbon (SOC) variation is considered a CO2 removal of the organization if its use is related to the production reported.

b) The calculation of removals must follow the methodologies established in IPPCC guidelines.

c) The processes valid as carbon input are exclusively naturally regenerative: manure management, below-ground biomass growth, and above-ground residues.

d) The producer must document, explain, and justify all data, values, and parameters used to calculate activity values as dry matter and manure deposition.

e) The producer must document, explain, and justify all data, values, and parameters used as reference factors for any process listed in c).

f) All factors, formulas, and proxy values used for variables needed must refer to the values published in IPCC guidelines; otherwise, the producer can ask the verifying team to pursue knowledge due diligence -KDD- of the reference used. If the conclusion is favorable, the producer can include the values.

g) KDD procedure:

i. The reference must be published in a scientific, peer-reviewed, and indexed academic journal.

ii. The publicized papers, citating the reference under study, must retain the values suggested to the producer.

iii. The reference is valid if the publication has public refusals, but the author addressed them and has the last word regarding the topic discussed, with no more refusals in one year.

iv. The system from which the author concludes the value used for the producer must be statistically representative of the producer systems under verification by the requirements of this document.

v. If results of i. to iv. are favorable, the producer must report a sensibility analysis of the results using the alternative proposed by IPCC, and if the materiality exceeds 20%, regardless of the results of i. to iv. , the value is rejected; otherwise, it is approved.

vi. The producer can appeal the KDD result by providing documentation, explanation, and justification of the validity for the reference. The evidence must be objective, impartial, and from at least three different renowned experts on the topic evaluated.

vii. If the appealing procedure results favorable for the use of the values, but the sensibility analysis continues to result in a materiality of over 20%, the level of assurance for the verification is limited, and the value of the insurance SI&R increase by 20%.

4.3.1 The producer must systematically monitor SOC variation through soil sampling and laboratory analysis. The experimental design must reduce the mathematical models' uncertainty. The producer has five years to demonstrate the value of SOC fixed. Meanwhile, the verification process goes with a limited level of assurance. Factors such as land use and land use changes (that must be zero since December 2020), organic matter inputs, and management practices must be considered.

4.3.2. Grazing in Managed Grasslands: Method I

During the first reporting cycle (five years), an indirect estimation will be allowed using methodologies valid for the IPCC. For its application, the producer must provide evidence that their production system complies with all the parameters within the model's applicable range:

a) It has low density: (0.6-1) individuals per hectare.

b) The soil is still not in carbon equilibrium.

d) Rotational grazing is practiced.

e) Direct seeding and complete absence of tillage are implemented.

The Equation for Organic Carbon Sequestration in Soils:

$$\boldsymbol{S_{SOC} = \sum_{i=1}^{n} (AGB_i * \left(\frac{BGB}{AGB}\right)_i * 0.47) - L}$$

S_{soc} = Soil Organic Carbon Sequestration $\left(\frac{Ton\ C}{ha\ year}\right)$

i = type of annual coverage, species/biome

AGB_i = Annual growth of aboveground biomass $\left[\frac{Ton\ Dry\ Matter\ (DM)}{ha\ year}\right]$

BGB/AGB = Proportion of belowground biomass (BGB) to aboveground biomass (AGB) for each type of annual coverage, species/biome i $[dimensionless]$

0.47 = IPCC estimation from (C. 3) of the proportion of carbon in dry matter of managed grassland crops $\left[\frac{Ton\ C}{Ton\ DM\ year}\right]$

L = represents the carbon loss from BGB due to respiration under different thermal conditions $[dimensionless]$

The organization's responsible for using official local published data from peer-reviewed scientific literature or official entities with technical influence in the sector. For example, in Uruguay, these may include INIA, MIAM, and MGAP.

The data used for AGBi must be specific to the production system and verified during the evaluation. The BGB/AGB ratio can be referenced from literature if the producer demonstrates the representativeness of the declared biome with those reported in the reference and follows a KDD procedure as established in 4.3 g)

The producer must annually report the results of direct soil analysis with a statistical experimental design, which will be verified during the evaluation process. The COS analytical studies should cover depths between 10 and 30 cm. Starting from the second reporting cycle -five years-producers whose analytical results indicate substantial variation -more than 10%- from the results with the method described in this section may choose to make the adjustments described in section 2.2.4.4. a), b), or c).

4.3.3. Grazing in Managed Grasslands: Method II

When the production system does not comply with, or cannot demonstrate compliance with, parameters a), b), c), d) and e) of 4.3.2., the producer may opt for calculating the balance of organic carbon emissions/removals in soil using the generic method presented in the IPCC Guide, Chapter 3, section.

Method II shall also be used when specific data on the annual dry matter or valid bibliographic references for the BGB/AGB ratio are unavailable for a particular biome type.

In any case, the producer may use both methods to complement the report. The producer must demonstrate the representativeness of their production system for the selection of model parameters and factors.

$$\Delta C_{Mineral} = \frac{\left[\left(COS_0 - COS_{(0-t)}\right) * A\right]}{T}$$

$$COS = COS_{ref} * F_{U_{c,s,j}} * F_M * F_i$$

Δ**C Mineral** = Annual change in mineral soil carbon content $\left[\frac{Ton\ C}{Ton\ DM\ year}\right]$

COS$_0$ = Soil organic carbon content in the inventory year $\left[\frac{Ton\ C}{ha}\right]$

COS$_{(0-T)}$ = Soil organic carbon content T years before the inventory $\left[\frac{Ton\ C}{ha}\right]$

T = Period covered by the inventory.

A = The area considered per biome type [ha]

COS$_{ref}$ = Reference soil carbon content $\left[\frac{Ton\ C}{ha}\right]$ The producer must obtain this value from the national greenhouse gas inventory (GHG) or, if unavailable, from Table 2.3 of Chapter 2, Volume 4 of the IPCC report or the most recent volume with approved adjustments.

FU$_{c,\ s,\ i}$ = Carbon stock change factor per type of land use system or subsystem and management model $[dimensionless]$ The producer must obtain this value from the national

GHG inventory or, if unavailable, from Table 2.2 of Chapter 2 and Table 6.2 of Chapter 6, Volume 4 of the IPCC report or the most recent volume with approved adjustments.

c = Climatic zone

s = Soil type.

i = Soil management type.

FM = Carbon stock change factor per soil management state (IPCC indicates several types and criteria: degraded, sustainable management, well-managed) $[dimensionless]$. The producer must obtain this value from the national GHG inventory or, if unavailable, from Table 2.2 of Chapter 2 and Table 6.2 of Chapter 6, Volume 4 of the IPCC (2019) report or the most recent volume with approved adjustments.

Fi = Carbon stock change factor per organic matter input $[dimensionless]$ The producer must obtain this value from the national GHG inventory or, if unavailable, from Table 2.2 of Chapter 2 and Table 6.2 of Chapter 6, Volume 4 of the IPCC (2019) report or the most recent volume with approved adjustments.

4.4. Uncertainty in the quantification of removals and quotes retained.

The amount of CO2eq deducted from the removal inventory is a safety margin to ensure reliability in declaring the product's environmental performance, as established in section 2.2.3.

4.4.1. In the specific case of producers with the potential result of carbon neutrality in the production system, the uncertainty value in the total quantification of removals is the basis for estimating the safety quota value.

4.4.2. The uncertainty calculation must follow the same guidelines presented in section 3.9. If necessary, a proxy for the uncertainty value of produced dry matter can be the dispersion of the average value per biome type.

4.4.3. Values taken from the bibliographic reference should be reported with the uncertainty published by the authors.

PART V - ADDITIONAL REQUIREMENTS

5.1. Greenhouse Gas Reduction

For this program, greenhouse gas reduction refers to actions designed to reduce emissions of one or all the greenhouse gases included in the latest verified inventory in the production system.

5.1.1. Scope of reductions

Reductions are valid if they accomplish all the following requirements:

a) they were identified in the last verified declaration of the carbon's product or organizational footprint.

b) they result from planned actions reported in a reduction plan for each source declared evaluation, as specified in section 5.3 of this document.

5.1.2. The reduction plan is part of the documents verified in the conformity assessment process.

5.1.3. Implementation and continuity of reduction actions

5.1.3.1 Upon entering the program, the organization must present a reduction plan that explicitly outlines the sources targeted by the activities, the methodology, and the reduction objectives. The plan must accomplish all the requirements of section 6 of the INTE B5: 2021 standard.

5.1.3.2. The organization must plan, implement, and demonstrate new reduction actions in any source each year. The same measure applied to the same source will not be allowed more than once unless an increase in the percentage of reduction is demonstrated. It is possible to present consecutive reduction actions on the same source if they are new. The limit of reductions is determined at the point of carbon neutrality or techno-economic feasibility.

5.2. Offsets

5.2.1. Organizations whose emissions exceed their removals may acquire offset units through internationally recognized mechanisms. These verified carbon credits are tradable; therefore, the producer can purchase them to include them in their inventory.

5.2.2. There are different offset mechanisms, and the producer can choose the one they consider better adjust its needs. Nevertheless, only carbon credits registered with international instruments will be accepted:

a) Verified Emission Reduction (VERs) from the Voluntary Carbon Standard Program - VERRA.

b) Certified Emission Reductions (CERs) from the Clean Development Mechanism.

c) Carbon Offset Projects from the Gold Standard.

5.2.3. The program may consider the inclusion of other registries at the request of the producer and evaluate them according to the base criteria of validity:

a) The selected mechanisms must provide a traceability chain from the removed greenhouse gas to the activities generating the offset unit.

b) The credit generation mechanism must comply with the concept of additionality according to Annex A, section A.3.3 of the ISO 14064-2:2018 standard.

c) If the credit unit comes from forest projects, they must provide evidence of deforestation-free activity since December 2020.

c) Only CO2 or CH4 credits will be accepted. If credits from other greenhouse gases are chosen, the organization The organization must demonstrate that such compensation aligns with the objectives defined by an identified interested party.

d) All carbon credits used under this program must demonstrate a minimum permanence until the year 2050 (including the intended use of the sink utilization).

e) If the credit unit come from projects related to the use of lands, the project must demonstrate that it does not violates the rights of indigenous people with its use.

f) The project must demonstrate no violation of Human Rights nor infant labor.

5.2.4. The HCPG program does not recognize carbon neutrality with offsetting.

5.2.5. The producer obtains recognition in Category II and III Low Carbon Livestock Production and Carbon Neutral, when achieving a low or negative emissions balance exclusively through their production efficiency in a regenerative system. The results of reduction actions are valid, but offsets cannot be included.

5.2.6. The producer can solicit the recognition of the net balance with offsetting. He must provide evidence of having reached the limit of technical reductions or that expanding their reduction measures is financially unfeasible or jeopardizes their financial stability.

5.2.6.1. A favorable opinion of 5.2.3, based on the evidence provided, leads to the recognition of Category I (Carbon footprint verified) with one of the following tags:

a) Low-Carbon/Offset

b) Zero Carbon/Offset

5.3. Systematic Quality Management

5.3.1. Systematic approach of the evaluation procedures

The HCPG applies a systematic approach to pursue the verification and certification of the Livestock production systems:

a) verifying carbon footprint following ISO 14064-3/14065/17029. For inventories following 14067, the normative reference is Annex C of ISO 14067:2018 and Section 8 of ISO 14064-1:2019 for inventories following ISO 14064-1

b) assessing the conformity of the results with the requirements for the certification in one of the program categories, following ISO 17021

c) Develop a KDD following the guidelines of ISO 19011 if needed.

5.3.2 Demonstration of Systematic Quality Management

The producers must develop a series of activities and procedures to ensure the quality and control of data to be assessed by the techniques derived from this program's systematic approach.

5.3.2.1. The organization must develop a protocol that, in a single document:

a) Demonstrates compliance with the general requirements of Section C.2 of Annex C of ISO 14067:2018 or Section 8 of ISO 14064-1:2019.

b) Describes the management system following Section C.3 of Annex C of ISO 14067:2018 or Sections 8.1.2 and 8.2 of ISO 14064-1:2019.

c) Establishes procedures and specifies the aspects indicated in Section C.4 of Annex C of ISO 14067:2018 or Sections 8.1.2 and 8.2 of ISO 14064-1:2019.

5.3.2.2. Report Requirements

The organization must prepare a results report that complies with Section 7 of ISO 14067:2018 or Section 9 of ISO 14064-1:2019, which must additionally include the following:

a) Fiscal identification and description of the organization preparing the declaration in the context of the country where the exercise occurs, including an annex with environmental authorizations and land and water use plans.

b) Description of the functional product and main customers and markets.

c) Identification of the LSQA HCPG Program as one of the intended users.

d) Identification of the used PCR if applied.

e) Publication date of the report and reporting period.

f) Complete results of inventory, following third and fourth section of this document.

g) Information about the following stages in the value chain to whom the results will be forwarded in the carbon pass (Chain of custody program CP v.1 2023)

h) A statement indicating that environmental declarations from different programs may not be comparable.

i) Plan of emission reduction actions and results of the actions implemented for the declared period, including the amount of GHG emissions reduced or avoided for each action in terms of ton CO2eq (where applicable).

j) Description of acquired offsets (where applicable), including the selected offset mechanism and the number of offsets acquired.

k) Indication of elements or data reported that should remain confidential. This clause does not apply to:

i. the inventory results of emissions/removals from significant sources

ii. the conclusion of the conformity assessment issued by LSQA after the verification process.

iii. The production system type according 3.1

PART VI - VERIFICATION PROCESS

6.1. Generalities

Verifying Carbon Footprint assesses the conformity of historical data and information declaration. The objective of the assessment is to determine if the producer's environmental statement regarding the result of their greenhouse gas emissions/removals inventory is materially correct and in compliance with the criteria of the HCPG program.

To obtain one of the recognitions from HCPG, the organization must undergo a third-party verification process by an LSQA verification team, following the verification criteria established in this program.

6.2. Applicable Standards

a) ISO 14064-3:2018 Greenhouse gases - Part 3: Specification with guidance for validating and verifying greenhouse gas assertions.

b) ISO 14065:2021 Greenhouse gases - Requirements for bodies that validate and verify greenhouse gases for use in accreditation or other forms of recognition.

c) ISO 17029:2019 Conformity assessment - General principles and requirements for validation and verification bodies.

d) ISO 14066:2011 Greenhouse gases - Competence requirements for greenhouse gas validation and verification teams.

e) ISO 14067:2018 Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification.

f) ISO 14064-1:2018 Greenhouse gases - Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.

6.3. Scope of Verification

LSQA conducts the third-party assessment following the processes described in Figure 1 of Section 2.1 of this document. The approach aligns with the quality plan established by LSQA, managed, and accredited according to ISO 17029 and ISO 14065.

The verification process aims to confirm the following aspects of the environmental declaration:

a) Compliance with the requirements stipulated in ISO 14067:2018 or 14064-1:2019.

b) Compliance with the used calculation procedures in the PCR (if applicable).

c) Compliance with the specific requirements of this program.

d) Coverage, accuracy, completeness, representativeness, coherence, reproducibility, truthfulness, quality, and data accuracy.

e) Absence of substantial discrepancies.

f) Quality and accuracy of the information.

g) No substantial discrepancies in organization-controlled primary data or site-specific data.

h) Compliance with reduction requirements and targets (if applicable).

i) Compliance with offsetting requirements (if applicable).

j) Compliance with the conditions for using declaration labels established in the LSQA logo and label use document (HCPG/E v.1 2023).

6.4. Assurance level and materiality

6.4.1. The level of assurance or confidence in the GHG declaration can be limited or reasonable.

a) Reasonable assurance means that the nature and extent of verification activities provide a high, but not absolute, level of confidence in the historical data and information. There is evidence to conclude that there is no substantial discrepancy in the declaration.
b) Limited assurance means there is no evidence to conclude that the environmental declaration has a substantial discrepancy.

6.4.1.2. During the first two years of participation in the program, regardless of the recognition category based on verified results, verification of removals will be carried out under a limited assurance level, unless the risk analysis conducted by the verification team determines otherwise.

6.4.1.3. From the third year onward, verifications are conducted with a reasonable assurance level. It is the producer's responsibility to prepare the necessary processes to reduce inherent verification risks and avoid the decision of LSQA not to accept the verification.

6.4.2. Materiality
Individual differences or the sum of differences between the results reported and the obtained by the verification team influence the recognition decisions of the HCPG program.
The program only accepts verifications with:
a) 5% materiality for emissions within the boundaries of the core process in the case of product carbon footprint or direct and indirect emissions from imported energy in the case of organizational carbon footprint.
b) 10% for upstream or downstream process emissions in the case of carbon product footprint and other significant indirect emissions in the case of organizational footprint, with the exception described in c).
c) 5% for indirect emission for the products used by the farm, specifically cattle and feedstock (grain and seeds) purchased. The producers can follow the established in b) for the remaining significant indirect emission.

d) 10% for annual CO2 removals from biomass grown in forest and carbon sequestration removals in the soil.

e) 5% on the total declared footprint.

f) From the fifth year, verifications will only be accepted with 5% materiality in all categories.

6.5. Verification Activities

To comply with the processes described in Figure 1 of section 2.1, the verification team requires the producer to agree to participate and facilitate the development of activities presented in the verification plan. Verification activities require:

a) Access to historical and accounting data: including but not limited to sanitary, environmental, and operational authorizations, sworn statements, consumption invoices, production and volume of unit sales records, equipment calibration, maintenance certificates, and digital records.

b) During the on-site visits to production and agricultural exploitation establishments, the organization must ensure access to the establishments and the necessary information to conduct the assessment and provide additional or clarifying information during the verification process.

6.6. Verification Opinion

Once the verification team completes and provides the verification opinion, LSQA, as an accredited and qualified OVV, will issue the Verification Declaration that will include the following:

a) The evaluated requirements following ISO 14067:2018 or ISO 14064-1:2019 and ISO 14065:2021 standards.

b) Reference to compliance with this program.

c) Description of the functional product, when following 14067, or organization's activities and method for consolidation if the reporting followed ISO 14064-1.

e) Scope covered by the declaration, including stages and operational limits, for reports following 14067 or organizational boundaries and reporting limits if the reporting followed ISO 14064-1.
g) Quantified, verified results expressed in tCO2eq per declared unit (ISO 14067) or tCO2eq per production cycle (ISO 14064-1).
h) Magnitude and description of reductions for each action executed during the reporting period, if included in the reduction plan.
i) Offsets and description of the characteristics of the compensation project used (when applicable).
j) Conclusion regarding recognitions (when applicable).

PART VII - REQUIREMENTS FOR ADDITIONAL RECOGNITIONS

LSQA is a Conformity Assessment Body (CAB) with a track record of over 25 years of contributing to organizations' sustainable and competitive development. While climate change is one of the areas of action, LSQA adheres to a comprehensive conception of sustainability.

Based on the Sustainable Development Goals (SDGs), sustainability encompasses social, economic, environmental, and health aspects. In this sense, LSQA recognizes the merits of organizations addressing these aspects through reliable and verifiable indicators. Specifically, recognize organizations working to generate positive impacts on climate action beyond their boundaries.

In the context of the HCPG program, participating producers can choose from different types of recognition by complying with the established conditions for each one. These conditions are set within the framework of various auditable programs and schemes available in the LSQA instrument portfolio and recognized by the ALTUS+ after a double materiality assessment.

7.1. Environmental Footprints

The organization can incorporate new environmental performance indicators, opting to verify the water or environmental footprint and report the potential for acidification, eutrophication, resource use, and energy consumption. (ISO 14046:2014; ISO 14040:2007)

7.2. ESG Reports

The organization demonstrates that it is managing aspects beyond the environmental footprint through certification in:

a) Environmental Management (ISO 14001:2015, "Environmental management systems - Requirements with guidance for use")

b) Occupational Health and Safety (ISO 45001:2018, "Occupational health and safety management systems - Requirements with guidance for use")

c) Energy Efficiency (ISO 50001:2018, "Energy management systems - Requirements with guidance for use")

d) Social Responsibility (ISO 26000:2010, "Guidance on social responsibility")

e) Sustainable Livestock Production Program LSQA

f) +G Program LSQA

PART VIII - REQUIREMENTS FOR CERTIFICATION MARK USE AND CHAIN OF CUSTODY.

8.1. In all cases, when the producer receives a favorable evaluation and any recognition (2.2.2., 7.1, 7.2), he must comply with the provisions in the declaration and seal usage manual (HCP/E V.1 2023). Using these elements is subject to unscheduled audits and determines the continued participation in the program and permissions for continued use.

8.2. For printed marks of certification labels, with verified declarations under the requirements of this program, it is mandatory to present the conclusion of the chain of custody audit in the establishments processing the verified livestock production

lots. It must be requested from LSQA at least ten days before the start of slaughter operations. The Carbon Footprint data is forwarded to the next stage in the value chain with the issue of a verified Carbon Pass following CP v.1 2023.

NORMATIVE REFERENCES

INTE B5:2021 Standard for demonstrating Carbon Neutrality. Requirements.

ISO 14027:2018 Environmental labels and declarations - Development of product category rules.

ISO 14044:2007/ISO 14044:2018 Environmental management - Life cycle assessment - Requirements and guidelines.

ISO 14064-2:2018 Greenhouse gases - Part 2: Specification with guidance at the project level for quantification, monitoring, and reporting of greenhouse gas emission reductions or removal enhancements.

ISO 14064-3:2018 Greenhouse gases - Part 3: Specification with guidance for the validation and verification of greenhouse gas statements.

ISO 14065:2021 Greenhouse gases - Requirements for greenhouse gas validation and verification bodies for use in accreditation or other forms of recognition.

ISO 14066:2011 Greenhouse gases - Competence requirements for greenhouse gas validation and verification teams.

ISO 14067:2018 Greenhouse gases - Carbon footprint of products - Requirements and guidelines for quantification.

ISO 17029:2019 Conformity assessment - General principles and requirements for validation and verification bodies.

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Global Roundtable for Sustainable Beef. (2022.) Beef Carbon Footprint Guideline: Global Beef Life Cycle Assessment Guideline. Location, The Netherlands.
Instituto Nacional de Investigación Agropecuaria. (2022). Emission factors and coefficients for Carbon Footprint studies in Uruguay: Livestock Sector. Consultation Manual.

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Uruguay. Report on the Environmental Footprint of Uruguay's Livestock. 2022. Ministry of Environment; Ministry of Livestock, Agriculture, and Fisheries; National Meat Institute; National Dairy Institute; National Institute of Agricultural Research.

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