Methodology Note

A. Calculating corporate GHG emissions

The methodology for calculating corporate emissions involved a three-step process:

1 Determining the quantity of meat and milk processed per year by each company, where possible. We utilised public company reports wherever possible, as well as data generated by *WATT* (Poultry Trends) and *IFCN Dairy Research Network* (formerly known as the International Farm Comparison Network). We used the year 2019 for poultry and 2018 for both pork and beef. Dairy volumes are based on the IFCN ratings from 2018 which utilise mostly 2017 volumes. Our calculations are based on different reference years as we used the most recent data available for companies' emissions in each sector at the time of calculation. For beef and poultry, we also determined the quantity of production per geographic region for each company, based on company reports.

2 Using the U.N. FAO's most recent and public GLEAM 2.0 data (with a data reference year of 2010) to determine the GHG emissions per kilo of beef, pork, poultry and milk (emissions factors) for each company. The GLEAM data includes regionalised slaughter weights, carcass dressing percentages and GHG emission intensity values on a per-tonne-of-product basis. For beef, poultry and milk, our calculation of emissions factors included a regional breakdown of production per company, given the available company data on geographic production and the GLEAM model's significant differences in emissions factors between regions. For pork, we used global averages to generate emissions factors for each company, given the lack of available company data on geographic production and the small variations in emission factors for industrial production provided by the GLEAM model for the relevant regions.

3 Multiplying the production quantity by the emissions factors to get the totals for each company, the emissions estimates obtained with GLEAM are intended to be approximate indicators of corporate emissions in the absence of standard and transparent emissions calculations and reporting across the industry. Our calculations are likely conservative estimates given that GLEAM limits land use change to "the transformation of forest to arable land for feed crops and that of forest to pasture" and uses the basic IPCC Tier 1 guidelines, rather than more detailed calculations. In reality, more pastureland expansion has taken place on natural grasslands and cropland expansion replaced mainly forests (IPCC Special Report on Land, chapter 1). Large conversions have also taken place in dry woodlands and savannas, for instance the Cerrado in Brazil. GLEAM also limits feed crop expansion to soybean and palm oil, thus excluding corn, barley, sorghum and other oilseeds used in animal feed.

We calculated the emissions of the top 10 corporate emitters/producers of beef, pork, poultry and dairy, respectively. Danish Crown, Vion Foods, Tönnies, Westfleisch and Group Bigard appear in two top 10 lists: pork and beef. Therefore, there are 35 companies in total whose emissions we have estimated.

Our emissions estimations based on this methodology can be found in our primary dataset: https://bit.ly/309bVxP. For a more detailed breakdown, see also the GLEAM emissions calculations: https://bit.ly/3xMb2yn — this file includes individual datasets for emissions of the top 10 beef, pork, poultry and dairy companies respectively. It also provides the most recent publicly available GLEAM data and emissions factors that we used to calculate company emissions.

B. Identifying corporate GHG emissions reporting and emissions reduction targets (as discussed in the report and cited in figures) for 20 of the largest corporate emitters plus five of the largest poultry emitters, a total of 25 companies.

For Annexe 1 and related information on company emissions reporting, their scopes and their climate targets, we investigated the emissions reporting and emissions reduction targets of 25 of the largest European beef, pork, poultry and dairy processors by volume. Even though poultry companies are not among the top 20 biggest emitters, they produce significant quantities of emissions, nonetheless. Thus, we also evaluated climate targets and reporting of five of them.

For each of the 25 companies, we attempted to obtain several types of information from sources such as companies' sustainability reports, corporate social responsibility reports,

public press releases, online descriptions on company websites or similar documents or filings containing details on GHG emissions and/or emission-reduction targets and plans. The types of information sought included the following:

- The latest greenhouse gas inventory/information filings with organisations such as the Climate Disclosure Project (CDP) and any climate targets set, including with the Science-based Target Initiative (SBTi).
- Information about how emission values were calculated, including system boundaries or scope, geographical area(s), corporate divisions included, time period, etc.
- Details of emission-reduction targets, including base year, target year, scope of emissions covered, and whether the target is intensity-based or for absolute emission reductions.
- Where adequate emissions data and reduction plans existed, we examined how companies plan to reduce emissions and meet targets.

It is important to note that there exists no central public repository for the meat and dairy industries' corporate emissions data or targets, nor on the number of animals they slaughter for beef and pork. Some companies publish this information in annual reports, others in sustainability reports, others on webpages and still others in filings with third parties such as CDP. Thus, it is sometimes difficult to determine whether a given company does or does not have an emission-reduction target, or if the company is reporting its emissions.

This situation is made more difficult by the fact that most companies we contacted by email with questions regarding emissions and targets did not reply. At times, publicly listed emails bounced back, and at other times, there was no response to their standard contact form or even after attempts to contact through multiple company-listed addresses.

We based our characteristics of corporations' emissions data and targets on extensive research of public websites and analysis of publicly available documents. Nonetheless, there remains the possibility that we may have listed a company as, for example, having no targets when in fact that company has published a target somewhere. As much as anything, this risk reflects the disorganised and dysfunctional emissions reporting and the need for a central public repository for such data.

A full compilation of our data on the 25 companies' reporting and targets are detailed in Annexe 1 (p. 44).

C. Change in company emissions over two years

For Figure 3, we compared change in emissions between 2015–2017 for dairy companies and 2016–2018 for pork and beef companies that featured in our first report with GRAIN, *Emissions Impossible: How Big Meat and Dairy are heating up the planet*. See Table 2.1 in primary dataset: https://bit.ly/309bVxP

D. Additional information on figures

The primary dataset contains the data for Figure 1, the comparison between top 20 corporations (Table 1.9.1, see also Annexe 2, p. 47) and EU countries (Table 3.1); for Figure 2, comparison between the companies and the Carbon Majors (Table 3.2); for Figure 6, the major meat and dairy producing countries in the EU based on EUROSTAT data (Table 1.1); and for Figure 7, IATP calculation of FAOSTAT data on production, consumption, exports and imports in years 2005 and 2018 (Tables 4.1–4.4). The primary dataset can be accessed at: https://bit.ly/309bVxP