

SB700 Large Confined Animal Facility Definition Summary of Preliminary Options for Consideration

Background

The California Air Resources Board (ARB/Board) is required under Senate Bill 700 (Florez) to develop a definition of a “large” confined animal facility (large CAF). The ARB staff held a series of workshops in August 2004 to discuss the definition and a livestock research symposium in January 2005 to have researchers present their preliminary findings. In addition, we have had many formal and informal meetings and communications with interested stakeholders. These stakeholders included environmental and community representatives, local air pollution control and air quality management districts (both individually and as part of the California Air Pollution Control Officers Association), livestock industry representatives, state and federal agencies, and academic researchers.

The foremost priority in developing a large CAF definition under SB 700 is addressing livestock related air quality impacts. Other key factors considered in developing the definition include the number of animals and facilities included under the definition, the size and types of facilities impacted, waste handling practices, ease of understanding the definition, consistency for the industry and regulators, economic impacts, and synergy with other environmental regulations.

The ARB staff is seeking public comments on several options that are possible for evaluating CAFs to determine those that are considered ‘large’ from an air quality perspective. The first one would base the definition on the number of animals at a facility, with the goal being to capture a high percentage of the animals while minimizing the number of facilities impacted. The second option would be a definition as a function of the emission factors. If the emission factors are found to be higher or lower, then the number of animals will change accordingly.

Attachment 1 presents proposed regulatory language for each of the options. The following sections provide some possible scenarios for the large CAF definitions based on a head count versus facility emissions approach. This document is not intended to serve as a complete reference for the analysis of the various large CAF definition proposals. It is meant to illustrate some of the key options for discussion during a public workshops scheduled for March 2, 2005 in Fresno, with video conferencing to Modesto, Bakersfield, and Diamond Bar. A complete staff report providing a full analysis of all options considered and supporting data will be released by the ARB in early May 2005. The Board will consider the staff’s proposal on June 23, 2005.

Scenario 1

Consolidated Industry Emissions – Fixed Head Count Definition

The first scenario for the large CAF definition is based on an analysis of the cumulative air quality impacts of the livestock industry within those areas of California with the most significant air quality problems. Based on this analysis, the following facility head count thresholds were developed (Table 1). Under this scenario, facilities that average a specified number of animals at a facility over the duration of a year would be considered “large.” These specifications would only rarely be updated based on substantial new data or regulatory needs. Note that for dairies, there are two different thresholds listed; one at 700 milk producing cows or equivalent, and one at 2000 milk producing head or equivalent. The ARB staff is seeking comments on both levels. In addition, the ARB staff is seeking comments on the appropriateness of defining the number of head as “milk producing cows or equivalent.” Equivalency would be determined by using standard manure generation rates for the different types of animals as established by the American Society of Agricultural Engineers.

Table 1. Scenario 1 – Possible Large CAF Head Count Specifications.

	Possible Large CAF Threshold
Dairy	700 or 2000 milk producing cows or equivalent
Beef Feedlots	1,000 beef cattle or their equivalent
Broilers	125,000
Layers	82,000 for dry manure systems 30,000 for liquid manure systems
Turkeys	55,000
Swine	2,500
Sheep	10,000
Goats	10,000
Horses	500
Ducks, Rabbits, Others	30,000

The goal of this definition is to capture a high percentage of the animals while minimizing the number of facilities impacted. Table 2 shows the California livestock facilities that would be affected at various head count specifications. Dairies represent the largest fraction of emissions of reactive organic compounds (ROG) compounds from CAFs. For dairies equal to or greater than 500 head, Table 2 shows that 87% of the head (roughly equivalent to emissions) would be located at 38% of the facilities based on USDA agricultural census data. Similarly, for dairies greater than 1000 head, Table 2 shows that 64% of the head (emissions) would be located at about 19% of the dairies. The ARB staff is continuing to develop additional information on the distribution of dairies by size to more specifically address 700 and 2000 head dairies and their contribution to emissions.

We also compared air-related size thresholds against the existing definitions for ‘large’ that are currently used for water quality regulations. For water quality purposes, the U.S. EPA defines a large dairy as 700 milk producing cows or 700 dry cows.

Table 2. California Livestock Facilities Affected at Various Facility Size Cuts

Livestock	Total		Size Cut	Facilities Larger than "Size Cut"			
	Facilities	Head		# of facilities	% of facilities	# of head	% of head
Dairy	2,793	2,806,357	500	1075	38	2,435,637	87
			1,000	517	19	1,796,992	64
Dairy SJV Only*	1,608 usda	1,419,815 usda	1,000 sjv	498 sjv	31 sjv	1,287,934 sjv*	91 sjv
Dairy SJV Only*	1,608 usda	1,419,815 usda	2,000 sjv	243 sjv	15 sjv	900,741 sjv*	63 sjv
Feedlots	552	535,734	1,000	19	3	513,813	96
			2,500	16	3	509,109	95
Broilers	338	47,354,087	55,000	45	13	46,573,052	98
			135,000	29	9	45,255,153	96
Layers	3,244	22,768,304	50,000	57	2	22,198,928	97
			100,000	44	1	21,236,253	93
Turkeys	237	8,790,704	30,000	66	28	8,647,995	99
			100,000	57	24	8,320,812	95
Hogs	1,521	163,465	1,000	10	1	126,594	77
			2000	6	0.4	123,094	75
Sheep	4,009	731,558	10,000	NA	NA	NA	NA
Goats	3,542	103,122	10,000	NA	NA	NA	NA
Horses	16,446	131,951	500	NA	NA	NA	NA

Reference: USDA Agricultural Census, 2002.

Note: Size cuts are based on USDA census size cuts and therefore they are not in direct agreement with the various facility size or emissions based size cuts provided for illustration of the large CAF definition scenarios. The USDA does not provide facility size information for sheep, goats, or horses.

*Values in this row based on partial SJV permitting data and are incomplete and approximate.

Scenario 2

Individual Facility Emissions –Emission Factor Based Definition

The second approach for defining large CAFs is based on the emissions calculated at each individual facility. Any facility exceeding this emissions threshold would be considered a large CAF. In this scenario, both changes in the emissions thresholds and changes in the data and methods for estimating livestock emissions would alter which facilities are considered large.

If the emissions threshold is based on ROG, one possible threshold level is one-half of the federal major source threshold for severe ozone non-attainment regions, which is 12.5 tons of ROG per year. The ARB staff is seeking comments on this level. Using existing methods and emissions estimates for livestock, Table 3 shows the number of livestock that would be needed to exceed the specified 12.5 per year of ROG emissions threshold. Of course, any change in emissions factor (EF) data or estimation methods could substantially alter the number of head estimates shown in the table. The number of head would be based on equivalency factors using standard manure generation rates for the different types of animals as established by the American Society of Agricultural Engineers.

Table 3. Scenario 2 – Large CAF ROG Emissions Specifications

	ROG EF (lbs/head/year)	Number of Head to Exceed Emissions Threshold
		12.5 tons/year
Dairy	12.8	1,953
Beef Feedlots	12.8	1,953
Broilers	0.192	130,208
Layers	0.192	130,208
Turkeys	0.192	130,208
Swine	4.64	5,388
Sheep	0.96	26,042
Goats	0.96	26,042
Horses	6.7	3,731

There is substantial research ongoing to improve the current livestock emission estimates, particularly the emission factors for reactive organic gases. The numbers shown in Table 3 are subject to change if new emission factors become available.

Air Districts With Good Air Quality and Limited Livestock Operations

In addition to the scenarios described, a variant is possible for both cases. Several air basins and air districts within California meet two criteria in that they 1) have relatively good air quality and, 2) they have relatively insignificant cumulative air quality impacts from livestock activities in the region.

In these regions, it may be possible to create a variant of either of the scenarios described in which the definition of “large” is less stringent so livestock facilities in those regions are not unnecessarily burdened with air quality regulations. For example, in an area with good air quality and minimal livestock, the per-head definition might be doubled, or in the facility emissions case, the emissions threshold might be doubled. Using this approach, only the very largest facilities in these regions would be subject to developing emission mitigation plans unless individual districts develop regulations that are more stringent.

Background Information on Livestock Emissions and Facilities Affected

There is substantial research ongoing to improve the current livestock emission estimates, particularly for reactive organic gases from dairies. The numbers shown are subject to change as new data become available. Figure 1 illustrates livestock ROG emissions in California.

Figure 1. California Livestock Reactive Organic Gas (ROG) Emissions

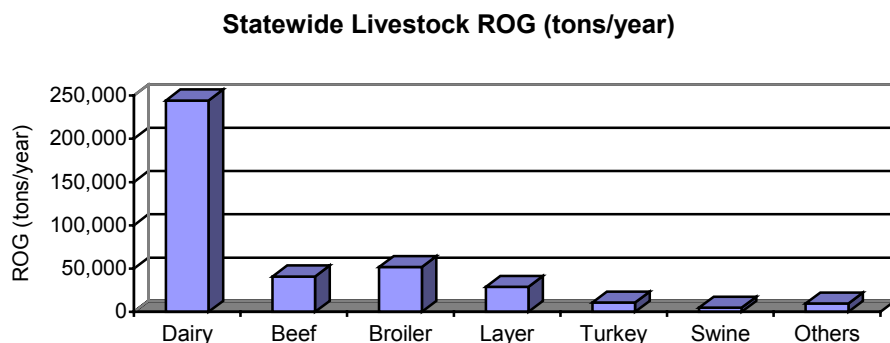
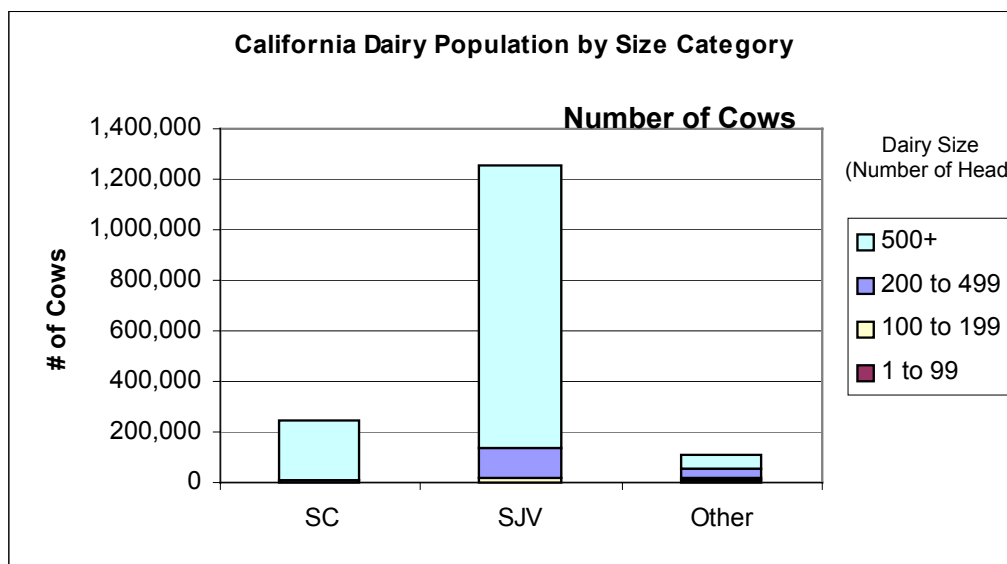
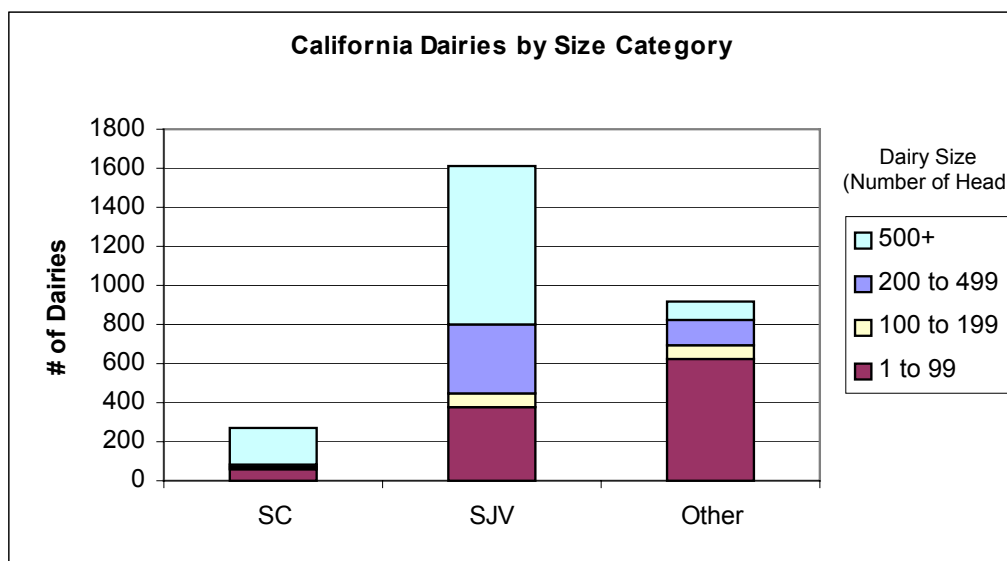


Figure 2 shows how dairies are regionally distributed in California and the size of these dairies. The upper graph shows the number of dairies in Southern California, the San Joaquin Valley, and all other parts of the state. The graph also shows the size of dairies in each region. The San Joaquin Valley has the majority of the dairies and about half of the dairies have over 500 or more producing cows at each dairy. The lower graph in Figure 2 shows the number of cows in each region. Again, the San Joaquin Valley has the majority of the cows, and most of these cows are in dairies with over 500 head. In comparison, in other parts of the state, the number of dairies over 500 head is small.

Figure 2. Detailed California Dairy Size Information For Southern California (SC), San Joaquin Valley (SJV), and All Other Regions (Other)

Number of Dairies



Source: 2002 Census of Agriculture California: Released June 3, 2004, by the National Agricultural Statistics Service (NASS), Agricultural Statistics Board, U.S. Department of Agriculture

# of Dairies by Dairy Size Groupings				
	1 to 99	100 to 199	200 to 499	500+
SC	62	4	20	182
SJV	372	76	355	805
Other	620	79	130	88

# of Cows by Dairy Size Groupings				
	1 to 99	100 to 199	200 to 499	500+
SC	390	-	6,957	240,722
SJV	4,133	10,748	120,888	1,116,641
Other	9,224	10,115	36,452	54,693

Attachment 1**Proposed Regulation Order**

The following preliminary draft regulatory language presents options for defining a large confined animal facility. The language is new and therefore is not shown in strikeout/underline format. The ARB staff is seeking comments on the proposed language and options presented.

Option 1. HEAD COUNT: Statewide Definition**§xxxxx Purpose**

The purpose of these regulations is to implement Health and Safety Code §40724.6 which requires the Air Resources Board to define "large confined animal facility."

§xxxxx Definitions

- (a) "Confined animal facility" includes but is not limited to, any structure, building, installation, barn, corral, coop, feed storage area, milking parlor, or system for the collection, storage, treatment, and distribution of liquid or solid manure, if domesticated animals are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing.
- (b) "Domesticated animals", include but are not limited to, cattle, calves, horses, sheep, goats, swine, rabbits, chickens, turkeys, or ducks.
- (c) "Milk-producing dairy cow" is any cow used for commercial milk production. The term milk-producing dairy cow includes pregnant cows to be used for milk production, but excludes "dry cows" and heifers that have not calved.
- (d) "Dry cows" are dairy cows no longer used for milk production.
- (e) "Beef cattle" are cattle fed by means other than grazing, to be marketed for meat.

§xxxxx Large Confined Animal Facility Definition

- (a) A large confined animal facility shall mean any confined animal facility that maintains on a daily average basis during any calendar year:
 - (1) 700 (or 2,000) or more milk-producing dairy cows; or their equivalent
 - (2) 1,000 or more beef cattle; or their equivalent
 - (3) 55,000 or more turkeys; or their equivalent
 - (4) 125,000 or more chickens other than laying hens at a confined animal facility that does not use a liquid manure handling system; or
 - (5) 82,000 or more laying hens at a confined animal facility that does not using liquid manure handling systems; or their equivalent
 - (6) 30,000 or more laying hens or broilers at a confined animal facility using liquid manure handling systems; or their equivalent
 - (7) 2,500 or more swine; or their equivalent
 - (8) 10,000 or more sheep, lambs, or goats; or their equivalent
 - (9) 500 or more horses; or their equivalent

- (10) 30,000 or more ducks; or their equivalent
 - (11) 30,000 or more rabbits; or their equivalent
 - (12) 30,000 or more other animals housed as specified in 30011(a)(1).
- (b) The following equivalency factors shall be used to determine if a confined animal facility is a large confined animal facility. (Equivalency would be determined by using standard manure generation rates for the different types of animals as established by the American Society of Agricultural Engineers.)

Option 2. EMISSION FACTOR BASED: Statewide Definition

§xxxxx Purpose

The purpose of these regulations is to implement Health and Safety Code §40724.6 which requires the Air Resources Board to define "large confined animal facility".

§xxxxx Definitions

- (a) "Confined Animal Facility" includes but is not limited to, any structure, building, installation, barn, corral, coop, feed storage area, milking parlor, or system for the collection, storage, treatment, and distribution of liquid or solid manure, if domesticated animals are corralled, penned, or otherwise caused to remain in restricted areas for commercial agricultural purposes and feeding is by means other than grazing.
- (b) "Domesticated animals", include but are not limited to, cattle, calves, horses, sheep, goats, swine, rabbits, chickens, turkeys, or ducks.

§xxxxx Large Confined Animal Facility Definition

A large confined animal facility shall mean any facility that emits on a daily average basis during any calendar year 12.5 tons per year of reactive organic gas emissions.