

METHODOLOGY

Purpose

The purpose of the *Kentucky Equine Survey (KyES)* was to describe the equine industry of the state in terms of demographics of both equids and equine operations. The last comparable study was conducted in 2012, and prior to that, 1977. Current information was needed for today's decision makers; in addition, industry changes relative to the 2012 study are now able to be measured. In addition, the study will also be used as another benchmark to measure future change in the industry. The detailed methodology for the equine inventory study is described below.

NASS Inventory Study

The *KyES* was designed and conducted through a collaborative effort between the University of Kentucky, the United States Department of Agriculture National Agricultural Statistics Service (USDA-NASS) and the Kentucky Horse Council.

For purposes of this study, the term "equine" includes horses, ponies, mules, and donkeys; an "equine operation" is considered to be a property (location, address?) that houses at least one horse, pony, mule, or donkey, whether or not the equine activities at that location are conducted for business purposes. This definition of an equine operation is more than USDA's definition of a farm, which is any establishment that has at least \$1,000 in cash receipts annually. Consequently, the *Kentucky Equine Survey* identifies equine residing on private residences that are not used for business purposes in addition to equine residing on USDA-defined farms, the latter of which would be included on the USDA Census of Agriculture that is conducted every five years.

When the study began, there was an initial list of 18,339 equine operations that was developed through extensive list-building efforts for the *2022 Kentucky Equine Survey*. List building for the survey sample involved acquiring names and addresses of members of cooperating equine organizations and a general solicitation for individuals to submit contact information through web pages hosted by UK and the Kentucky Horse Council. The call for participation was announced through press releases, which were picked up by many prominent industry publications. Additional names and addresses were collected at public engagement meetings. These meetings were programmed by the Kentucky Horse Council or UK faculty and extension workers in counties around the state and included a short presentation about the survey. During meetings, attendees were encouraged to provide contact information to the survey personnel.

The new list-building efforts resulted in the collection of 1,511 names and addresses. As they were received, names were checked for duplication against those already on the pre-existing list; duplicates were removed. A portion of operations were contacted by telephone by NASS to obtain preliminary information regarding the numbers of horses at those operations so that the survey sample could later be stratified by size (where size of the operation is measured by the approximate number of horses). The final list was comprised of operations and individuals including private owners of one to two horses at their residences, boarding facilities, large commercial breeding operations, and racetracks. From the entire list of 19,850, a random sample, stratified by geographic location and size, was drawn and surveys were sent to 15,000 equine operations. If surveys were not returned, telephone enumerators contacted the operations to obtain the information. In addition, field enumerators visited some of the largest

farms included in the study to assist with data collection. To capture information on equine operations not on the list, the equine survey was included in the Agricultural Coverage Evaluation Survey, which was combined with the June Area Survey sample in constructing the area component of the sample. Two hundred seventy-seven segments of land were canvassed by field enumerators who collected data on all agricultural activities in those areas.

Fifteen thousand surveys were distributed by mail in late June 2022. Each survey also included a weblink and unique ID for respondents to complete the survey online if they preferred. Telephone follow-up commenced in August 2022, and field enumeration began in September 2022. Of the 15,000 surveys distributed, 9,240 (62%) produced responses. Of those, 903 refused to participate; the remaining 8,337 (56%) records were used for analysis. Surveys from operations with at least one equid were reviewed, edited and entered into a database by NASS personnel. When a survey was partially completed or the non-respondent was an extremely large operation, imputation was utilized to account for non-response. Otherwise, non-response was accounted for through an adjustment to the original sampling weights. List sample records were expanded by strata and summarized, then records from the 277 area segments that were not on the list (NOL) were expanded and added to the results of the list to produce state level multiple frame indicators. To produce more robust county level indicators, a final reweighting was then done, by which weights on NOL records were set to zero while weights on list records were adjusted, such that the expanded state list indication equaled the expanded state multiple frame indication. The list sample records were expanded by this final weight to produce county level indications. The estimation process produced an estimate of total equine in the state with a relative error of 1.4% of the estimate.

In spite of concerted efforts to obtain completed questionnaires, the response rate for the *2022 Kentucky Equine Survey* (56%) was lower than that of the *2012 Kentucky Equine Survey* (65%). There are a number of possible explanations for the decline. First, NASS reports an overall trend of decreased survey participation across all of its surveys. Second, large-scale natural disasters in the year leading up to the survey devastated the western and eastern parts of Kentucky (December 2021 and July 2022, respectively). Although targeted attempts were made to increase response rates in these areas, respondents likely had more pressing matters to attend to as recovery and rebuilding efforts continued. Table A1 lists the response rate by county.

Table A1. 2022 Kentucky Equine Survey Response Rates by County

County	Response Rate (%)	County	Response Rate (%)	County	Response Rate (%)	County	Response Rate (%)
ADAIR	54	EDMONSON	59	KNOX	67	NICHOLAS	54
ALLEN	55	ELLIOTT	69	LARUE	51	OHIO	60
ANDERSON	55	ESTILL	58	LAUREL	58	OLDHAM	54
BALLARD	62	FAYETTE	52	LAWRENCE	60	OWEN	50
BARREN	57	FLEMING	53	LEE	66	OWSLEY	58
BATH	53	FLOYD	46	LESLIE	71	PENDLETON	53
BELL	47	FRANKLIN	52	LETCHER	38	PERRY	85
BOONE	54	FULTON	58	LEWIS	55	PIKE	50
BOURBON	56	GALLATIN	45	LINCOLN	54	POWELL	55
BOYD	52	GARRARD	55	LIVINGSTON	70	PULASKI	60
BOYLE	57	GRANT	56	LOGAN	57	ROBERTSON	78
BRACKEN	63	GRAVES	55	LYON	58	ROCKCASTLE	54
BREATHITT	35	GRAYSON	54	MCCRACKEN	54	ROWAN	59
BRECKINRIDGE	52	GREEN	54	MCCREARY	55	RUSSELL	60
BULLITT	55	GREENUP	55	MCLEAN	59	SCOTT	54
BUTLER	54	HANCOCK	54	MADISON	59	SHELBY	55
CALDWELL	50	HARDIN	56	MAGOFFIN	63	SIMPSON	58
CALLOWAY	60	HARLAN	57	MARION	53	SPENCER	56
CAMPBELL	59	HARRISON	56	MARSHALL	62	TAYLOR	55
CARLISLE	60	HART	61	MARTIN	67	TODD	54
CARROLL	63	HENDERSON	55	MASON	56	TRIGG	55
CARTER	60	HENRY	59	MEADE	54	TRIMBLE	54
CASEY	53	HICKMAN	59	MENIFEE	44	UNION	61
CHRISTIAN	52	HOPKINS	50	MERCER	58	WARREN	61
CLARK	56	JACKSON	46	METCALFE	54	WASHINGTON	64
CLAY	58	JEFFERSON	50	MONROE	57	WAYNE	63
CLINTON	52	JESSAMINE	58	MONTGOMERY	51	WEBSTER	60
CRITTENDEN	54	JOHNSON	49	MORGAN	51	WHITLEY	54
CUMBERLAND	62	KENTON	55	MUHLENBERG	58	WOLFE	61
DAVISS	56	KNOTT	35	NELSON	52	WOODFORD	54