Additional guidelines for style and units – Use of percentage

Because of the intense use of units in percentage form (%), the Editorial Board of **Revista Brasileira de Zootecnia** defines that percentage should be exceptionally and seldom used only for description of relative variations (e.g., variation of a result obtained in a given treatment in relation to other treatment) and not as an absolute unit of measurement.

1. Chemical or feed composition of diets

Chemical compositions of diets or feedstuffs have to be expressed as mass contents, e.g., g kg^{-1} of dry matter or g kg^{-1} as fed.

Examples:
Food composition of the concentrate mixture supplied to animals

Item	Incorrect (%)	Correct (g kg^{-1} as fed)
Corn grain	70.0	700
Soybean meal	27.0	270
Urea	1.0	10
Mineral mixture	2.0	20

Chemical composition of corn silage

Item	Incorrect (%)	Correct (g kg^{-1} as fed)
Dry matter[1]	35.23	352.3
Organic matter[2]	95.45	954.5
Crude protein[2]	7.86	78.6
Ether extract[2]	2.35	23.5
Neutral detergent fiber corrected for ash and protein[2]	55.86	558.6
Non-fibrous carbohydrates[2]	29.38	293.8
Non-protein nitrogen[3]	32.45	324.5

[1] Incorrect: percent as fed. Correct: g kg^{-1} as fed.
[2] Incorrect: dry matter percentage. Correct: g kg^{-1} dry matter.
[3] Incorrect: total nitrogen percentage. Correct: g kg^{-1} total nitrogen.

2. Measures of intake

Measures of intake have to be expressed as mass consumed per mass unit per unit of time.

Example:
Incorrect: "… animals presented average intake of 2.52% of body weight…"
Correct: "… animals presented average intake of 25.2 g kg^{-1} d^{-1} of body weight…"

3. Units expressed as coefficients

In animal science, it is common to produce variables given by the ratio between two variables. Therefore, because they represent direct measures made at the experimental unit and not relative comparisons among different situations (e.g., among treatments), those variables have to be expressed as mass unit per mass unit.

Most common examples:

Measures of digestibility coefficients:
Incorrect: "… the apparent digestibility coefficient of dry matter was 62.5%…"
Correct: "… the apparent digestibility coefficient of dry matter was 0.625…" (In this example, because it is a fractional measure, it is understood that it is expressed as g g^{-1} or kg kg^{-1}). Another possibility is to express it as 625.0 g kg^{-1} of dry matter.

Measures of fractions in degradation assays or body fraction yields or microbial growth
Incorrect: "… estimate of potentially degradable insoluble fraction of protein was 36.2%…"
Correct: "… estimate of potentially degradable insoluble fraction of protein was 36.3 g/100 g…" Another possibility is to express it as 363.0 g kg^{-1} of crude protein.

Incorrect: "…average carcass dressing was 52.1% of body weight…"
Correct: "…average carcass dressing was 52.1 kg/100 kg of body weight…"
Incorrect: "… a microbial yield efficiency of 12.53% in comparison with intake of total digestible nutrients…"
Correct: "… a microbial yield efficiency of 125.3 g of microbial protein per kg of total digestible nutrients…"

Rates or variations over time in enzymatic measures or degradation assays or transit in the gastrointestinal tract
Incorrect: "… passage rate of fibrous material in the rumen environment was 3.5%/h…"
Correct: "…… passage rate of fibrous material in the rumen environment was 0.035 h^{-1}…" The number of decimal places to be presented should not exceed four; otherwise use scientific notation, i.e., a × 10^{b}, or change the scale of measurements.

Coefficients of correlation and determination, and descriptive levels of probability
Coefficients of correlation and determination, and levels of probability are fractions and should not be expressed as percentage.
Incorrect: "… the coefficient of determination of the model was 92.53%…"

Correct: "... the coefficient of determination of the model was 0.9253..."

Incorrect: "... variables were strongly correlated (r = -82.39%)..."
Correct: "...variables were strongly correlated (r = -0.8239)..."
Incorrect: "... α = 5%."
Correct: "... α = 0.05."

4. Correct use of percentages

As previously highlighted, percentage should be used only for description of relative variations. And it must be used with parsimony.

Example:

Table 1 - Serum urea nitrogen concentrations (SUN, mg dL^{-1}) ... in grazing cattle

Item	Suplement[1]			CV (%)
	Control	Protein	Starch	
SUN	9.5b	14.3a	9.4b	7.8

[1] Means within rows followed by different letters are different by the Tukey test (P<0.05).

"...protein supplementation increased SUN concentration by 50.5% in relation to the control..."