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THE COMPARISON OF THE LABEL CONTENT IN SELECTED DRY FOODS FOR DOGS AND CATS IN 2011 AND 2013

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Summary. The objective of this study was to compare the content of selected complete dry feed labels for adult, healthy dogs and cats, emphasizing the accordance with the relevant EU requirements which have recently came into force. Additionally, simple calculations of the energy content were made to enhance the characteristics of the products available to the customer. The level of accordance reached in average 87% and 82% in dog and cat food respectively. It should be stated that the improvement of the labels content, as compared with 2011, was not significant. The key elements of the label information were either not improved or decreased (the statement of the necessity of constant access to water or daily dosage per animal). All evaluated products were typical maintenance foods, but their energy density was quite differentiated which may have some deleterious nutritional consequences associated with their long time supply.

Key words: dry feed, label content, maintenance pet food, energy density

INTRODUCTION

Commercial pet foods are an easy way to fulfill the nutrient requirements of pets. Dry petfood products dominate global sales with strong and stable market position. This sector predominates wet products approximately 50%. In 2013, relatively largest part of the petfood sales was in Europe. However, the choice of an adequate product is a frequent dilemma for pet owners whether major companies design their product portfolio accordingly to human's tastes [Czajkowska et al. 2013].

The vast abundance of products of various quality infers the necessity for the profound knowledge of the nutritional value of the product, which typically needs to be gathered from

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the label. The adequacy of the information on the package, corresponding with the content properties is therefore crucial for the health of the pets. The European Pet Food Industry Federation represents 26 countries and promotes responsible ownership of pets. One of its most important publication is, revised in 2011, Code of good labelling practice for petfood [FEDIAF 2011], that gives an augmented explanation of the rules, applicable in pet food label analysis. The major source of legislation remains an EC Regulation 767/2009.

In Poland, the EU legislation concerning labelling of dog and cat foods came into force after two years of transition period, in September 2013. At this moment, all products present on the market were obligated to be fully complied with the above mentioned Regulation.

The objective of this study was to compare the accordance of the label content of selected dry food commercially available in Poland in 2011 and 2013 with EU regulations, complemented with simple nutritional quality estimation.

MATERIALS AND METHODS

The label content of the set of dry dog and cat foods was evaluated, regarding their accordance with EU labeling regulations.

In the first phase total number of 27 commercial dry food labels (15 for dogs, 12 for cats) was assessed. The labels were obtained in 2011, during the intermediate period preceding the full implementation of EU law in Poland [EC 767/2009]. Product and producer names were encoded as P1 to P15 for dogs and K1 to K12 for cats. All products were available on the market for at least 12 months, representing the popular brands, sold in pet stores as in supermarkets, reflecting the portfolio of four major petfood producers active in Poland, and one smaller company. One product was imported, labeled as manufactured on the other continent.

In the second, final phase of the study (year 2013), only 24 labels were analyzed, because some products evaluated in the first phase were removed from the market by manufacturers, therefore direct comparison for these was not possible.

There was no effect of the manufacturer or brand on the label's content, therefore it was considered negligible and not presented in the study.

Table 1 presents the list of elements of the information on the label, considered in the analysis. The selection of assessed labeling particulars was compiled of mandatory and voluntary elements [EC 767/2009, FEDIAF 2011].

Three types of information were assigned for each of the label's particular: correct (1), incorrect (0), potentially misleading (no marking). The average level of accordance (ALA) was calculated for each analyzed element of the label (ALAE) and for each product (ALAP) commercially available in 2011 and 2013.

The obtained results were compared with Wilcoxon's rank sum test, using IBM SPSS (v. 19PL).

For all analyzed products, the energy density (ED) and caloric distribution as an amount of metabolic energy derived from protein, fat and carbohydrates were assayed according to the method described in Case et al. [2011], based on modified Atwater equations.

Table 1. Elements of pet food labels evaluated in 2011 and 2013
Tabela 1. Elementy etykiet karm oceniane w roku 2011 i 2013

Product description Opis produktu	Type of feed – Rodzaj karmy
	Animal species – Gatunek zwierzęcia
Instructions for proper use Instrukcja stosowania	Daily ration in the terms of amounts to be fed relative to the life stage Dzienna ilość karmy właściwa dla wieku zwierzęcia
	Indication of the necessity to ensure fresh water availability at all times when feeding dry food Wskazanie konieczności zapewnienia stałej dostępności wody pitnej
Feed material declaration Deklaracja składu	Heading: COMPOSITION – Nagłówek: SKŁAD
	Listed by specific name in descending order by weight Składniki wymienione w porządku malejącym według masy
	The name and percentage of weight of a feed material, if emphasized on the label Nazwa i udział procentowy składników podkreślonych na froncie etykiety
Analytical constituents Składniki analityczne	Weight percentage: crude protein, crude fibres, crude oils and fats, crude ash Odsetek wagowy: białko surowe, włókna surowe, tłuszcze surowe, popiół surowy
	The total amount of amino acids, vitamins, and/or trace elements, if declared under the heading Zawartość całkowita aminokwasów, witamin i/lub pierwiastków śladowych jeśli zadeklarowane
Additives Dodatki	Heading: ADDITIVES – Nagłówek: DODATKI
	Technological additives – Dodatki technologiczne
Contact data Dane kontaktowe	Business address – Adres przedsiębiorstwa
	Company name – Nazwa firmy
	Free telephone number or other appropriate means of communication to obtain the information on the product Bezpłatny numer informacji telefonicznej lub inny sposób uzyskania danych o produkcie
Technical data, traceability Dane techniczne, pochodzenie	Net quantity – Masa netto
	Minimum storage life – Minimalny okres przydatności
	Batch number – Numer partii

RESULTS AND DISCUSSION

The overall results of the study showed substantial variation in the accordance with legislation, presented by the evaluated labels.

Table 2 presents generalized accordance of evaluated pet food label elements with EU labeling regulations. The incorrect information on dog food labels appeared less frequently in 2013 than it did in 2011. Interestingly, the number of potentially misleading information was higher on cat than that on dog food labels and slightly increased in 2013.

For the explanatory reasons the ALAP results were presented in graphic form in Figures 1 and 2. The highest level of recorded incorrect and misleading information was 26% in 2011. On some labels it was subsequently reduced (P15), but on K8 label both incorrect and misleading information levels remained unchanged (5 and 26% respectively).

Table 2. The proportion of the results of the accordance assessment

Tabela 2. Proporcje wyników oceny zgodności

Label information Informacja na etykiecie	Dogs – Psy		Cats – Koty	
	2011	2013	2011	2013
Correct (C) Zgodna	10	12	10	10
Incorrect (I) Niezgodna	6	3	4	3
Possibly misleading (M) Potencjalnie myląca	5	5	6	7

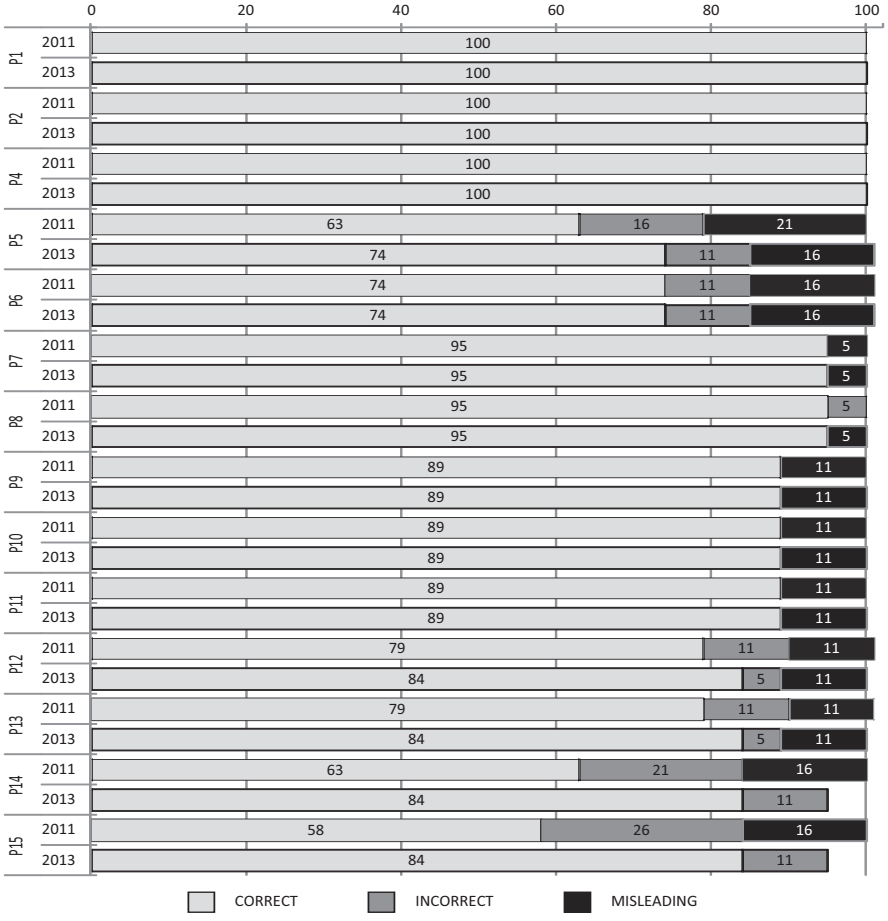

Fig. 1. The accordance percentage of dog foods in ALAP category

Rys. 1. Procent zgodności karm dla psów w kategorii ALAP

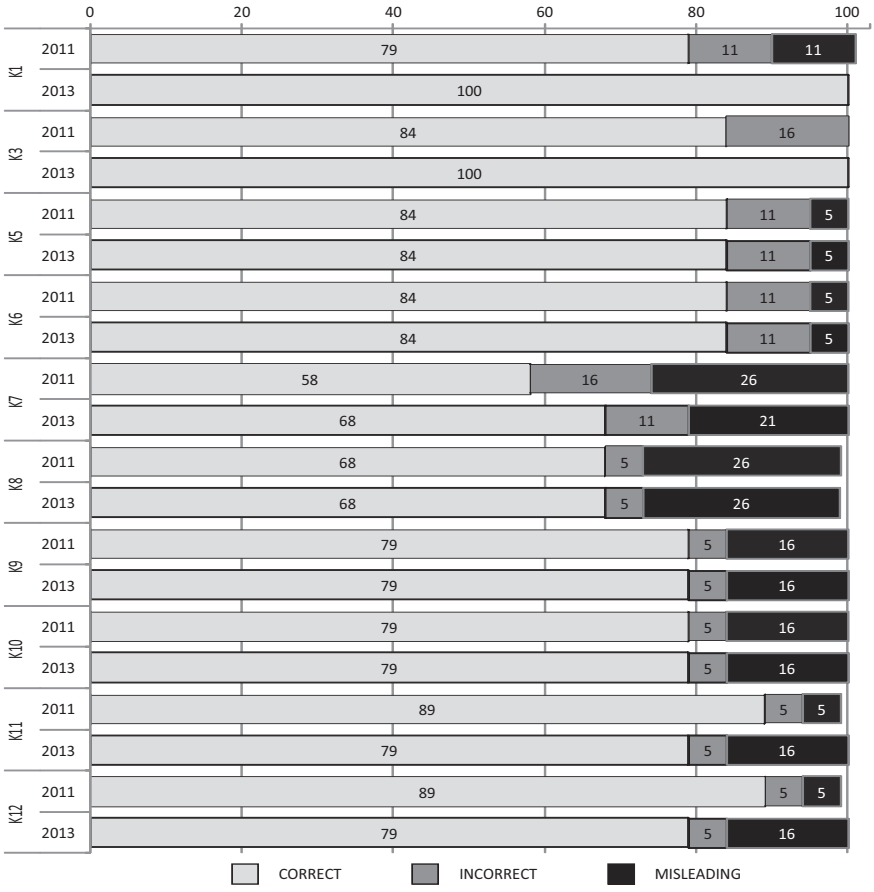

Fig. 2. The accordance percentage of cat foods in ALAP category

Rys. 2. Procent zgodności karm dla kotów w kategorii ALAP

Therefore it may be noted that improvement can be observed in some cases, but the trend was not as strong as one might have expected. General impression is, that dog food labels were better adjusted to new UE regulations, but the relatively small sample groups compared in the study, do not allow drawing major conclusions.

Figures 3–6 show the detailed distribution of incorrect and misleading information on the reviewed labels. Presumably the most disadvantageous observations on 2013 dog food labels were: increased level of incorrectly stated necessity of ensuring constant access for fresh water and no improvement in the absolutely mandatory information of weight percentage of components, emphasized (claimed) on the front of the package (Fig. 3), whilst the former of a particular importance for its possible severe health complications. There is an absolute need for constant water supply during dry food offering, regardless of the initial moisture content of the diet [Marcon de Brito et al. 2010, Case et al. 2011].

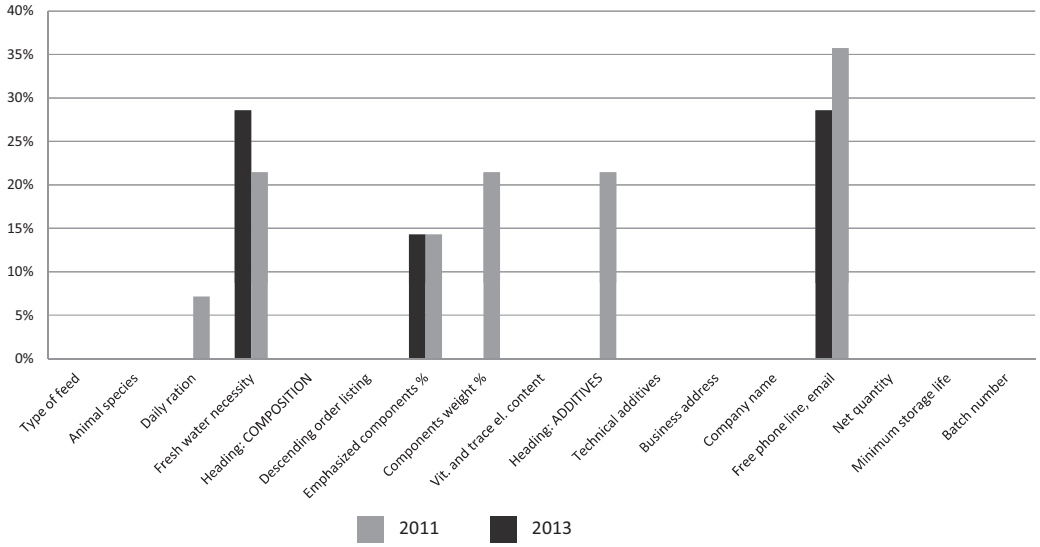

Fig. 3. Incorrect information on dog food labels

Rys. 3. Udział informacji niezgodnych na etykietach karm dla psów

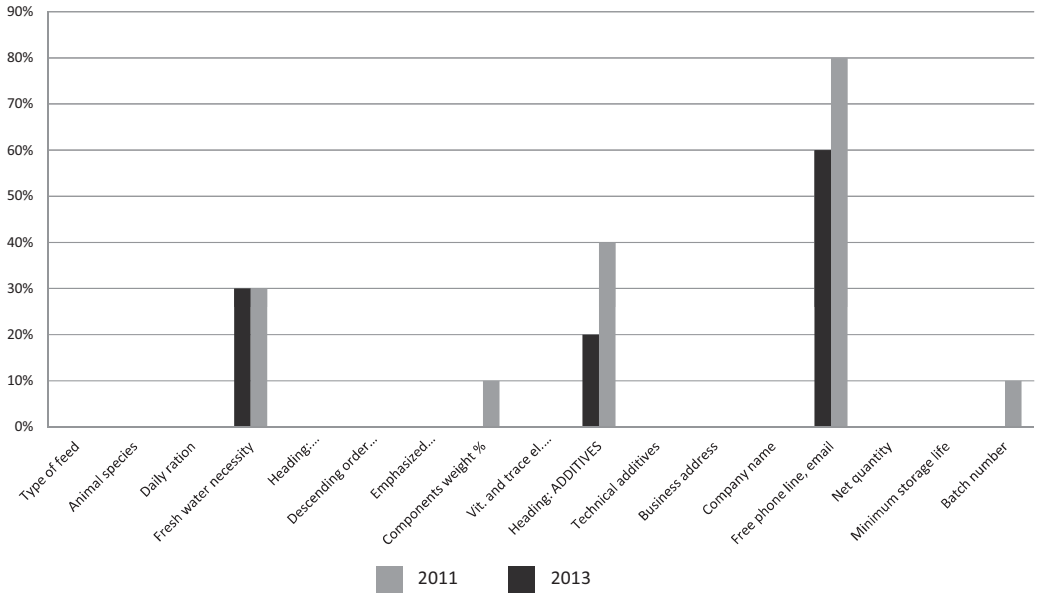

Fig. 4. Incorrect information on cat food labels

Rys. 4. Udział informacji niezgodnych na etykietach karm dla kotów

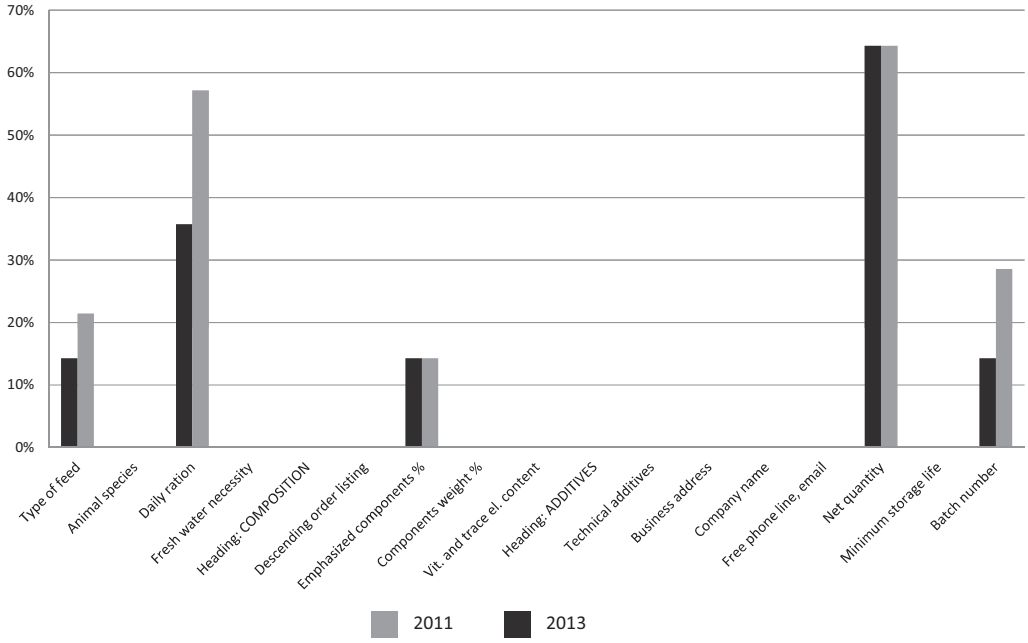

Fig. 5. Potentially misleading information on dog food labels

Rys. 5. Udział informacji potencjalnie mylących na etykietach karm dla psów

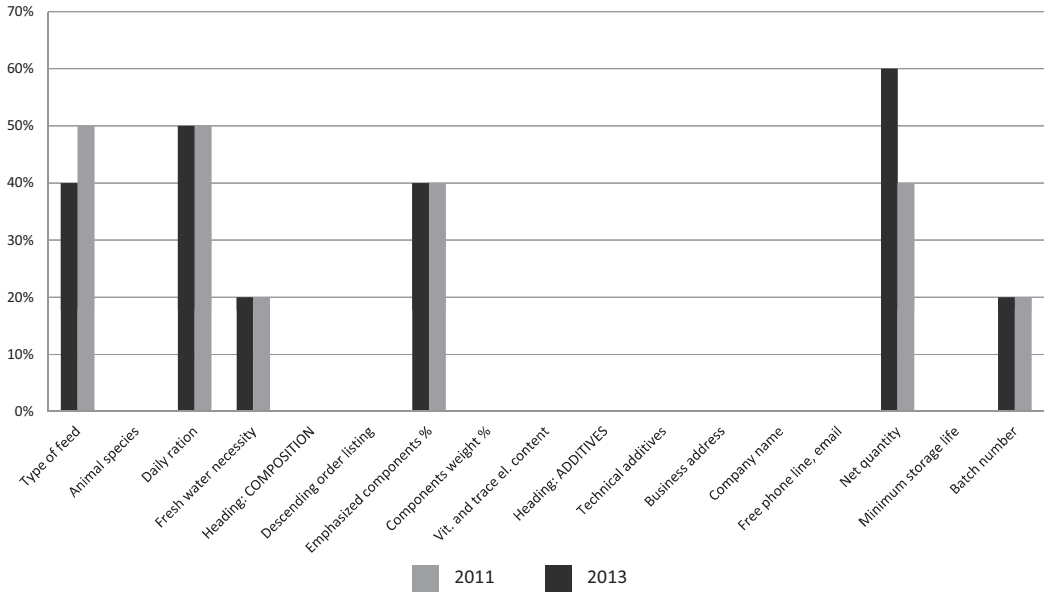

Fig. 6. Potentially misleading information on cat food labels

Rys. 6. Udział informacji potencjalnie mylących na etykietach karm dla kotów

The substantial level of potentially misleading information on both, dog and cat food labels concerned the daily ration, which is commonly considered a key element for the appropriate management of the body weight [Heuberger and Wakshlag 2011, Murphy et al. 2012]. In general, 6 of 17 evaluated label elements of cat food showed substantial amount of misleading information, in most cases both in 2011 and 2013.

The indexes of accordance (Table 2), indicate the moderate trend of improvement in the ALAE values, considering the correct information on the label. The tendency is notably stronger in dog than that in cat food. However slightly increased level of misleading information on 2013 cat food labels in both ALAE and ALAP categories may be regarded confounding (Table 3).

Table 3. The average level of accordance (ALA) of the dry petfood labels [%]
Tabela 3. Średni poziom zgodności (ALA) na etykietach karm [%]

		2011		2013		Significance* Istotność*
		Mean	±SD	Mean	±SD	
		ALAE				
Dogs Psy	C	82.00	21.54	87.35	18.69	0.062
	I	7.06	11.23	4.24	9.91	0.221
	M	10.88	20.63	8.35	17.31	0.109
Cats Koty	C	77.06	25.92	80.00	24.24	0.238
	I	10.00	21.51	6.47	16.18	0.063
	M	12.94	19.61	13.53	20.9	0.655
		ALAP				
Dogs Psy	C	82.07	16.18	82.57	15.43	0.655
	I	7.93	9.84	7.14	9.73	0.276
	M	10.07	7.69	10.29	6.83	0.593
Cats Koty	C	76.80	10.75	79.80	12.12	0.336
	I	10.20	4.94	6.60	4.43	0.109
	M	13.00	10.15	13.60	9.93	0.705

ALAE – accordance calculated for the label's element/zgodność obliczona dla elementu etykiety.

ALAP – accordance calculated for the product's label/zgodność obliczona dla produktu.

C – correct/zgodne.

I – incorrect/niezgodne.

M – misleading/mylące.

*Wilcoxon's signed-rank test/test Wilcoxona.

Probably the most bothering observation was, that on some labels the levels of incorrect and potentially misleading information were constant in 2011 and 2013. This may indicate, that in fact there was no concern of some of the petfood manufacturers and distributors currently operating in Poland, for the accurate labelling of their products.

Numerous Authors have emphasized, that the description placed on the label is the main element of decision making for customers [Kurosad 2010, Berwid-Wójtowicz 2011, Case et al. 2011]. Therefore one may speculate, that the consequence of misleading label information are unwanted food purchases and possible further nutritional effects.

Above mentioned observations were as well reiterated in the significance of ALA differences assessment between 2011 and 2013. The ALAE values were most generally more favorable that those of ALAP, with the dog food correct information index increase from 82 to 87% (Table 3).

The divergent accordance results reveal rather disadvantageous picture of cat dry food labeling. That situation may in some manner link with increasing number of overweight cats [BCS – Body Condition System > 5, Laflamme 1997], euphemistically perceived by their owners [Kienzle and Bergler 2006], and together with some previously described nutritional peculiarities in cats [Zaghini and Biagi 2005], lead to long term issues like obesity and related diseases [Bermingham et al. 2010].

According to FEDIAF [2011], the energy content can be voluntary indicated on the label. Its value should be calculated accordingly to the methods, presented in FEDIAF Nutritional Guidelines for Cats and Dogs [2013]. Table 4 presents the results of ED calculations for products evaluated in the study. It can be noticed, that such assessment can be performed by the responsible pet owner, carefully planning the nutrition scheme for the pet.

In a recent study reported by Linder et al. [2012], similar calculations were made to evaluate potential risk of nutritional deficiency with caloric restrictions in dogs. Among five diets tested, one was described as maintenance with caloric density of 380 kcal/100g. Interestingly, two more diets, included in that study had the weight loss and therapeutic weight loss status, with the ED values 331 and 327 kcal/100 g, respectively. As compared to the current results (Table 4), they show only a slight difference (6–7 kcal/100 g) which may have two potential implications. Firstly, the owner can proximately calculate and compare the nutrient profiles of the commercially available products for dogs and cats, making responsible choice at purchase what, coupled with the consequently offered daily ration (bowl size) regime, may facilitate optimal body weight management of his pet. Secondly, it can strengthen the awareness, that commonly offered maintenance diets may present quite high ED, what should entail deliberate caution with any *ad libitum* feeding attempts.

That aspect emerges more seriously, comprehending the recent results of customers preferences, showing that the owners of overweight dogs express significantly less interest in corrected dog nutrition than owners of normal weight dogs [Suarez et al. 2012].

One more plausible asset of simple ED estimation described above, can be the alleviated adjustment of the nutrition strategy of the pet, matching the actual energy expenditure, to perpetuate stable body weight over time [Ramsey and Hagopian 2006, Sallander et al. 2010].

Table 4. Calculated values of ED in dog and cat food
Tabela 4. Wartości ED obliczone dla karm dla psów i kotów

Code – Kod	Energy density Gęstość energetyczna [kcal/100 g]	Protein – Białko	Fat – Tłuszcz	Carbohydrates Węglowodany
		[%]		
P1	338,25	24,8	30,2	45,0
P2	338,25	24,8	30,2	45,0
P4	375,25	27,0	40,8	32,2
P5	361,55	24,2	32,9	42,9
P6	375,85	22,3	38,4	39,2
P7	364,45	25,0	35,0	40,0
P8	369,75	22,7	35,6	41,6
P9	339,50	22,2	26,3	51,5
P10	337,75	22,3	26,4	51,3
P11	339,50	22,2	26,3	51,5
P12	345,00	23,3	32,0	44,6
P13	348,50	24,1	31,7	44,2
P14	351,00	30,9	41,2	27,9
P15	361,50	31,0	40,0	29,0
Mean Średnia	353,02			
K1	343,50	34,6	29,7	35,7
K3	375,75	33,5	36,2	30,3
K5	372,25	32,0	36,5	31,5
K6	372,25	32,0	36,5	31,5
K7	366,20	30,6	34,8	34,6
K8	369,00	31,3	34,6	34,1
K9	356,50	30,4	38,1	31,4
K10	356,50	30,4	38,1	31,4
K11	341,25	32,8	26,2	41,0
K12	344,75	32,5	25,9	41,6
Mean Średnia	359,58			

CONCLUSIONS

The limiting factor of the current study is its hypothetical nature, and it should be stressed that presented comparison and assumptions warrant further *in vivo* validation.

However, the assessment of the accordance of the selected dry pet food labels information with the EU regulations had the confounding effect and revealed rather unsatisfactory level of accurateness.

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PORÓWNANIE TREŚCI ETYKIET WYBRANYCH KARM PEŁNOPORCJOWYCH DLA PSÓW I KOTÓW W 2011 I 2013 ROKU

Streszczenie. Celem prezentowanych badań była ocena treści wybranych etykiet pełnoporcjowych suchych karm dla dorosłych, zdrowych psów i kotów, z podkreśleniem zgodności z aktualnymi wymaganiami unijnymi. Średni poziom zgodności wyniósł 87 i 82%, odpowiednio dla psów i kotów. Warto podkreślić, że między 2011 a 2013 rokiem nie nastąpiła istotna poprawa treści etykiet karm. Kluczowe elementy informacyjne etykiet nie zostały poprawione, a nawet uległy pogorszeniu (np. zdanie o konieczności zapewnienia wody pitnej czy informacja o zalecanej dziennej dawce na zwierzę). Wszystkie oceniane produkty należały do grupy typowych karm bytowych, jednak ich gęstość energetyczna była dość zróżnicowana, co w perspektywie ich długookresowego podawania może mieć niekorzystne konsekwencje żywieniowe.

Słowa kluczowe: sucha karma, treść etykiety, karma bytowa, gęstość energetyczna