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Avaliação Escrita

EDITAL N° 01/2021/PPGMVCI

Cada candidato deverá responder, obrigatoriamente, um total de **QUATRO QUESTÕES**, de livre escolha dentre as 6 questões da prova. Caso sejam respondidas mais que quatro questões, serão corrigidas apenas as 4 primeiras respostas na ordem que aparecerem no arquivo de resposta.

As respostas, devem ser redigidas em Língua Portuguesa, deverão ser devolvidas **até às 14:00** horas do mesmo dia (06/04/2021 - horário de Brasília) por e-mail (sipg.ppgmvc@contato.ufsc.br) informando no assunto “Seleção Mestrado - nome do candidato”.

As respostas deverão seguir as normas abaixo:

- A avaliação deverá conter um cabeçalho apresentando unicamente o número do edital e o número de inscrição do candidato. **As avaliações NÃO deverão ser nominadas.** Avaliações nominadas levarão à desclassificação do candidato.
- As respostas deverão ser encaminhadas em **um arquivo único, identificado com o número da inscrição do candidato.** O conjunto das respostas deverá estar contido em no **MÁXIMO 6 PÁGINAS**, tamanho A4, com margens de 2 cm, letra tipo *Times New Roman* tamanho 12 e espaçamento 1,5 cm; gravado em formato de extensão “.pdf”. Avaliações que não estiverem em formato PDF levarão à desclassificação do candidato.
- **As provas deverão conter ao final a seguinte declaração de inexistência de plágio:** “Declaro que o texto acima é original, de minha autoria, não contendo material copiado no todo ou em parte de quaisquer outras fontes, sem a devida referência”. As avaliações serão verificadas utilizando-se um *software* anti-plágio, o qual se constatado levará à desclassificação do candidato.

QUESTÃO 1:

Effect of oxygen tension and antioxidants on the developmental competence of buffalo oocytes cultured *in vitro*

Amro M. El-Sanea¹, Ahmed Sabry S. Abdoon¹, Omaira M. Kandil¹, Nahed E. El-Toukhy², Amal M. Abo El-maaty¹ and Hodallah H. Ahmed²

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Available at www.veterinaryworld.org/Vol.14/January-2021/10.pdf

Table-1: Effect of oxygen tension during *in vitro* culture on maturation and developmental rates of buffalo oocytes (Mean±SEM).

Group	Number of oocytes	Maturation rate (%)	No. of fertilized oocytes	Embryo development rate %				
				Fertilization rate (%)	Embryo development rate (%)			
					2-4 cell	8-16 cell	Morula	Blastocyst
5% oxygen	274	85.0±1.3 (233)	212	82.5±2.0 (175) ^a	26.2±1.6 ^b	21.1±1.2	28.3±1.1	24.4±1.3 ^a
20% oxygen	246	72.4±1.0 (178)	178	73.6±1.5 (131) ^b	37.83±1.4 ^a	21.2±1.2	28.4±1.8	13.6±1.6 ^b

^{a,b}Superscripts within the same column differ significantly at $p < 0.05$.

Table-2: Effect of antioxidant supplementation into *in vitro* maturation medium on cumulus cells expansion and nuclear maturation of buffalo oocytes.

Group	No. of oocytes	Cumulus cell expansion (%)				Nuclear maturation (%)	
		G0	G1	G2	G3	Mature	Non-mature
Control (BMM)	158	11.7±1.2 ^b	19.7±1.3 ^b	22.5±2.0 ^a	53.9±4.1 ^b	66.4±2.7 ^b	33.6±2.7 ^b
Ascorbic acid (50 µM)	290	10.4±3.6 ^b	11.6±2.6 ^a	19.7±3.1 ^a	58.4±6.4 ^b	73.0±2.9 ^{a,b}	26.96±2.9 ^{a,b}
Glutathione (3.0 mM)	234	14.6±0.5 ^b	19.80±0.88 ^b	24.7±1.4 ^a	40.9±3.9 ^b	58.7±2.1 ^b	41.3±2.1 ^b
Melatonin (10 ⁻⁵ M)	188	7.6±1.4 ^a	8.3±1.4 ^a	12.2±1.7 ^b	71.9±4.6 ^a	82.1±3.3 ^a	17.9±3.3 ^a

*Differs significantly within the same column at $p < 0.05$

PERGUNTA: Analise as tabelas 1 e 2 e descreva qual o efeito da tensão de oxigênio sobre as taxas de fertilização e desenvolvimento embrionário *in vitro* e qual o efeito da suplementação do meio de maturação *in vitro* com antioxidantes, sobre a expansão das células do *cumulus* e sobre a maturação nuclear dos oócitos de búfalos (2,5 pontos).

QUESTÃO 2:

Animal Science Journal (2008) 79, 620–627

doi: 10.1111/j.1740-0929.2008.00572.x

ORIGINAL ARTICLE

Physical conditions in a cattle vehicle during spring and autumn conditions in Japan, and reactions of steers to long distance transport

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ABSTRACT

The objective of this study was to investigate transportation conditions and behavioral and physiological responses of beef steers to long distance commercial transport in Japan. In spring (May) and autumn (September), eight (16 in total) Japanese Black \times Holstein steers (7.8 ± 0.6 month of age; 310.3 ± 13.9 kg) were transported by truck. The transport distance was 1013.1 km (25 h including lairage periods) comprising 627.6 km (6.4 h) on expressways, 143.5 km (3.5 h) on arterial roads and 242.0 km (10.5 h) by ferry. The loading space of the truck gave a space allowance of about 1.62 m²/head. Internal temperature (\pm SD) and humidity (\pm SD) of the truck were $14.7 \pm 4.7^\circ\text{C}$ and $72.7 \pm 22.4\%$ in spring, $24.4 \pm 2.8^\circ\text{C}$ and $70.8 \pm 14.4\%$ in autumn. Vibration acceleration (\pm SD) of the truck in the longitudinal direction was greater in spring (-0.19 ± 0.43 m/s²) than in autumn (-0.15 ± 0.20 m/s²) ($P < 0.05$). There were no effects of season and driving conditions on the internal noise. Internal airflow velocity (\pm SD) of the truck was greater in spring (0.75 ± 0.70 m/s) than in autumn (0.45 ± 0.40 m/s) ($P < 0.05$), and it was greater while moving on expressways (0.77 ± 0.40 m/s) and arterial roads (0.63 ± 0.61 m/s) than when parked (0.16 ± 0.26 m/s) (both $P < 0.05$). Steers lay down more frequently while moving on expressways than the expected frequency ($\chi^2 = 121.9$, $P < 0.01$). Steers were oriented parallel to the direction of travel (to the front cabin: 27.9%; to the tailgate: 23.4%) more frequently than the expected probability (12.5%). Blood glucose concentration, serum ALT activity and plasma cortisol concentration were greater in spring than in autumn (all $P < 0.05$). Serum pH was higher in autumn than in spring ($P < 0.01$). Blood glucose concentration was significantly higher at the market before transport, and serum total protein, triiodothyronine and total cholesterol concentrations were also significantly higher at the market and just after transport than 1 week after transport (all $P < 0.05$). However, the other physiological measurements such as plasma cortisol and blood lactate concentrations, serum pH and heart rate did not change after transport. The results indicate that in Japanese spring and autumn conditions, long distance transport with appropriate conditions including low stocking density and enough lairage time with provision of food and water might not cause severe stress for steers.

Key words: beef cattle, behavior, stress, transport, welfare.

INTRODUCTION

The various effects of transport on cattle have been studied in Europe (Tarrant 1990; Trunkfield & Broom 1990; Knowles 1999) and the United States (Grandin 1993, 1997; Schaefer *et al.* 1997). In Japan, the beef industry needs to transport cattle long distances due to the geographic separation of breeding and fattening regions. In many cases, young steers and heifers are

sold by auction in a livestock market, and then they are transported for several hours to a fattening farm. However, there are few studies of commercial cattle transport in Japan. In this study, basic data on animal

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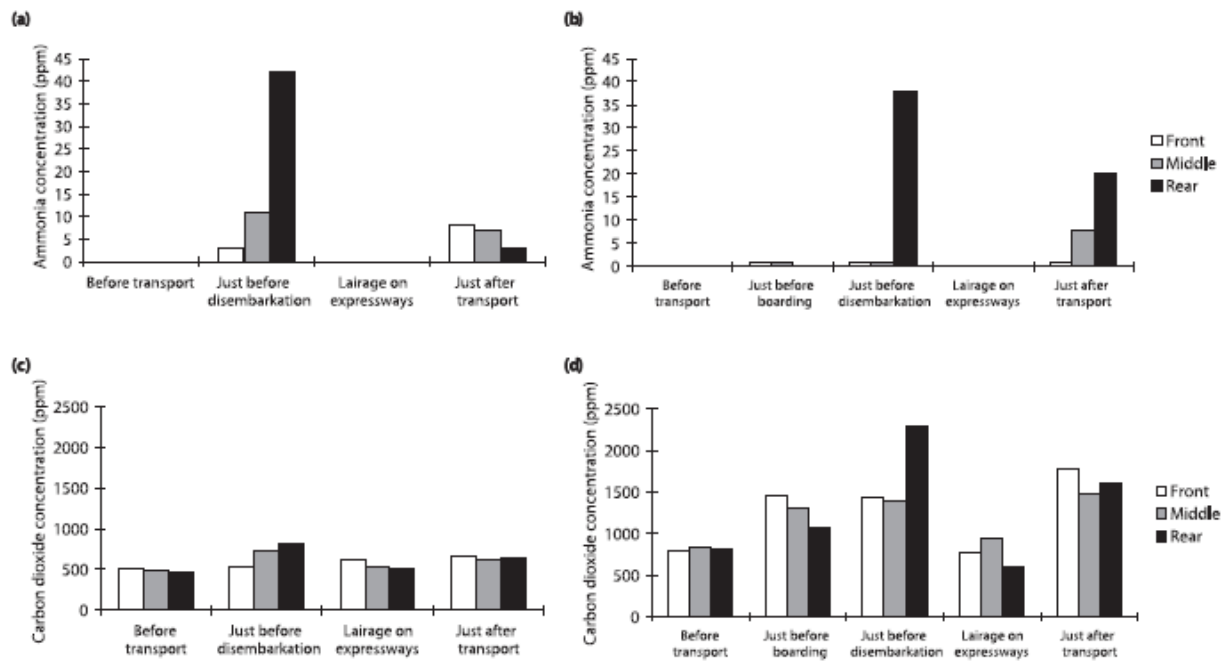


Figure 1 Ammonia concentration in the loading space of the truck in (a) spring and (b) autumn. Carbon dioxide concentrations in the loading space of the truck in (c) spring and (d) autumn. Ammonia and carbon dioxide concentrations were measured at three points in the loading space of the truck: the front (near the cab), the middle and the rear (near the tailgate) of the loading space before loading steers at the market, before boarding a ferry, just before disembarkation (measured only in autumn), during lairage on the expressways and just after unloading at the fattening farm.

- a) Descreva os resultados descritos na figura 1 (1,0 pontos)
 b) Qual a posição no caminhão tem a melhor qualidade para os animais, independente da época do ano e justifique sua escolha (1,5 pontos).

QUESTÃO 3:

As tabelas abaixo são referentes aos resultados de uma pesquisa visando comparar a lucratividade da produção de frango orgânica versus a convencional. Com base nessas informações e na legenda das tabelas, responda:

a) Descreva e discuta o resultado de cada tabela (Tabelas 2-4) (1,25 pontos).

b) Faça uma conclusão geral sobre qual seria o sistema de produção mais lucrativo (1,25 pontos).

Table 1 – Technical data of organic and conventional production systems

	Organic	Conventional
Birds at the start of a round (number)	400	400
Birds slaughtered in the round (number)	396	388
Slaughter age [(duration of a round) (days)]	81	42
Rounds per year (number)	3.5	5.5
Space inside (birds m ²)	10	18
Space outdoor (m ² per bird)	4*	0
Slaughter weight (g)	2,778	2,250
Carcass weight (g)	2,145	1,735
Total broiler meat production (kg year ⁻¹)	2,973	3,702
Feed intake in the round (g per bird)	8,041	4,255
Feed conversion rate (kg feed per kg growth)	2.930	1.931
Mortality (%)	1.00	2.83

*The outdoor run must be accessible at least one-third of their life.

Table 2 – The total variable costs per broiler (€) in organic and conventional broiler rearing systems

	Organic	Conventional
Chicks	0.41	0.32
Feed	3.48	1.31
Vaccines and medication	0.13	0.07
Labour	0.43	0.03
Litter	0.08	0.04
Heating	0.16	0.14
Electricity	0.03	0.10
Water and watering	0.54	0.01
Cleaning and disinfection of poultry house	0.19	0.27
Slaughter	0.52	0.43

Table 4 – Production costs and net income (€) in organic and conventional broiler production systems in a year

Production costs and net income (€)	Organic	Conventional
Total selling price (total gross production value)	11,249.19	7,003.78
Feed	4,843.72	2,840.94
Chicks	567.57	713.51
Vaccines and medication	181.62	154.59
Labour	605.41	59.46
Litter	113.51	95.14
Heating	227.03	297.30
Electricity	37.84	225.95
Water and watering	756.76	11.89
Cleaning and disinfection of poultry house	264.86	594.59
Slaughter	726.71	911.28
Total variable costs	8,325.03	5,904.64
Depreciation costs of the building	68.11	44.14
Maintenance costs of the building	22.70	12.61
Depreciation costs of the machinery and inventory	28.11	27.32
Maintenance costs of the machinery and inventory	8.65	8.41
Costs for the outdoor run	216.22	0.00
Certification expenses	329.24	0.00
Total fixed costs	673.03	92.48
Total costs	8,998.06	5,997.12
Total gross margin (profit)	2,924.16	1,099.14
Total net income	2,251.13	1,006.66

Table 3 – Production costs and net income (€) per kg broiler meat produced in organic and conventional systems

Production costs and net income (€ kg ⁻¹)	Organic	Conventional
Selling price (gross production value)	3.78	1.89
Variable costs	2.80	1.59
Fixed costs	0.23	0.03
Total costs	3.03	1.62
Gross margin (profit)	0.98	0.30
Net income	0.75	0.27

QUESTÃO 4:

As questões abaixo são referentes ao artigo:

Tian, Q., & Piao, X. (2019). Essential oil blend could decrease diarrhea prevalence by improving antioxidative capability for weaned pigs. *Animals*, 9(10), 847.

a) A busca por substâncias alternativas aos antibióticos como promotor de crescimento tem ampliado as pesquisas utilizando diferentes ferramentas. Dentre elas, os óleos essenciais tem ganhado espaço nas pesquisas e novas moléculas de aditivos lançadas no mercado. Isto porque os óleos essenciais são metabólitos secundários extraídos das plantas que possuem atividade antioxidante, anti-inflamatória e antimicrobiana, entre outras atividades.

Observe a tabela 3. De acordo com os resultados obtidos estatisticamente, **os óleos essenciais estudados neste artigo seriam uma boa alternativa ao antibiótico?** Disserte sobre este assunto (1,0 ponto).

Table 3. Effects of essential oil supplementation on the growth performance and diarrhea prevalence of weaned piglets ¹.

Item	CON	AB	EO	SEM	p-Value
Days 1–14					
Average daily gain, g	283	305	301	19.7	0.71
Average daily feed intake, g	453	465	447	33.9	0.93
Feed conversion ratio	1.6	1.5	1.5	0.05	0.32
Diarrhea prevalence, %	17.4 ^a	11.2 ^b	12.6 ^b	0.78	<0.01
Days 15–28					
Average daily gain, g	405 ^b	475 ^a	462 ^a	17.8	0.03
Average daily feed intake, g	747	840	802	35.8	0.21
Feed conversion ratio	1.8	1.8	1.7	0.04	0.25
Diarrhea prevalence, %	9.3 ^a	4.8 ^b	5.7 ^b	0.69	<0.01
Days 1–28					
Average daily gain, g	344	390	381	18.3	0.20
Average daily feed intake, g	599	653	624	33.5	0.54
Feed conversion ratio	1.7	1.7	1.6	0.04	0.15
Diarrhea prevalence, %	13.3 ^a	8.0 ^b	9.2 ^b	0.45	<0.01

CON = basal diets; AB = basal diets supplemented with 20 mg/kg colistin sulfate and 40 mg/kg zinc bacitracin; EO = basal diets supplemented with 100 mg/kg essential oil blend. ¹ Values are the means of six observations per treatment, and different superscripts within a row indicate a significant difference ($p \leq 0.05$).

b) Observe a tabela 4.

Table 4. Effects of essential oil supplementation on apparent total tract digestibility of nutrients in weaned piglets on day 28 in the experiment ¹.

Item	CON	AB	EO	SEM	<i>p</i> -Value
Gross energy	0.79 ^b	0.80 ^{ab}	0.81 ^a	0.001	0.04
Dry matter	0.81	0.81	0.81	0.005	0.65
Crude protein	0.75 ^b	0.78 ^a	0.78 ^a	0.008	0.04

CON = basal diets; AB = basal diets supplemented with 20 mg/kg colistin sulfate and 40 mg/kg zinc bacitracin; EO = basal diets supplemented with 100 mg/kg essential oil blend.¹ Values are means of six observations per treatment, and different superscripts within a row indicate a significant difference ($p \leq 0.05$).

A utilização dos óleos essenciais melhorou ou piorou a digestibilidade? A qual(is) fator(es) se deve(m) esta melhora ou piora da digestibilidade (0,75 pontos).

c) O aumento de bactérias resistente aos antibióticos de uso em humanos fez com que os olhares dos consumidores caíssem sobre a produção animal. Cada vez mais o termo *one health* está presente nas discussões que envolve todas as produções animais, visando promover a saúde animal, da sociedade e do ambiente. A partir deste artigo e desta terminologia, sugira uma continuidade para este estudo (0,75 pontos).

QUESTÃO 5:

O texto a seguir faz parte dos resultados obtidos no artigo intitulado “Comparison of Pulsed Radiofrequency, Oxygen-Ozone Therapy and Epidural Steroid Injections for the Treatment of Chronic Unilateral Radicular Syndrome” (Ryska P. et al. *Medicina*, v.57, n.2, 2021, doi 10.3390/medicina57020136).

3.2.1. Vas Scores

The median pre-treatment VAS score of all groups was six points. At the early post-treatment time points, the largest reduction in the median VAS score (to 3.5 points) was observed in the TFESI group (a decrease of 41.7%); in the PRF and TFOOT groups, the VAS score decreased to 4 points (a decrease of 33%) and 5 points (a decrease of 16.7%), respectively. There was a significant difference in the early post-treatment VAS score between the TFESI and TFOOT groups ($p = 0.0152$). The median VAS scores at the third and sixth months after treatment were comparable among groups (five points), and these values were lower than the pre-treatment values. The persistent decrease in the median VAS score, therefore, was approximately 16.7% with respect to the pre-treatment state. There were no statistically significant differences in the VAS score among groups at three or six months after treatment.

3.2.2. ODI Scores

The pre-treatment median ODI scores were 24, 20, and 23 points for PRF, TFOOT, and TFESI, respectively. At the third month after treatment, the median ODI scores in the PRF, TFOOT, and TFESI groups were 20, 18, and 20.5 points, respectively, and at the sixth month, the scores were 21, 18.5, and 18 points, respectively. The range of ODI decrease was 7.5 to 21.7%. No significant differences in the ODI score were found among the methods at any follow-up timepoint.

3.2.3. Adverse Effects

Two cases of non-severe and highly transient complications (nausea and mild headache) were observed in the TFOOT group immediately after the procedure. Both patients fully recovered within 15 min, with no residual complaints. An early post-treatment increase in the VAS score was noted in 45 patients: 15 (26.3%) in the PRF group, 20 (29%) in the TFOOT group, and 10 (19%) in the TFESI group.

VAS – Visual Analogue Scale; ODI – Oswestry disability index; TFESI – Transforaminal epidural steroid injection; TFOOT – Transforaminal oxygen ozone therapy, PRF – Pulsed radiofrequency

PERGUNTA: Algum dos tratamentos pode ser considerado mais eficaz em relação aos demais? Por quê? Comente sobre as demais informações que os resultados apresentam (2,5 pontos).

QUESTÃO 6:

As figuras abaixo foram extraídas de um trabalho que avaliou uma formulação que combinava duas espécies de fungos nematófagos no controle de verminoses de ovinos na região semiárida do Brasil. Analise-as com atenção e responda as questões relacionadas.

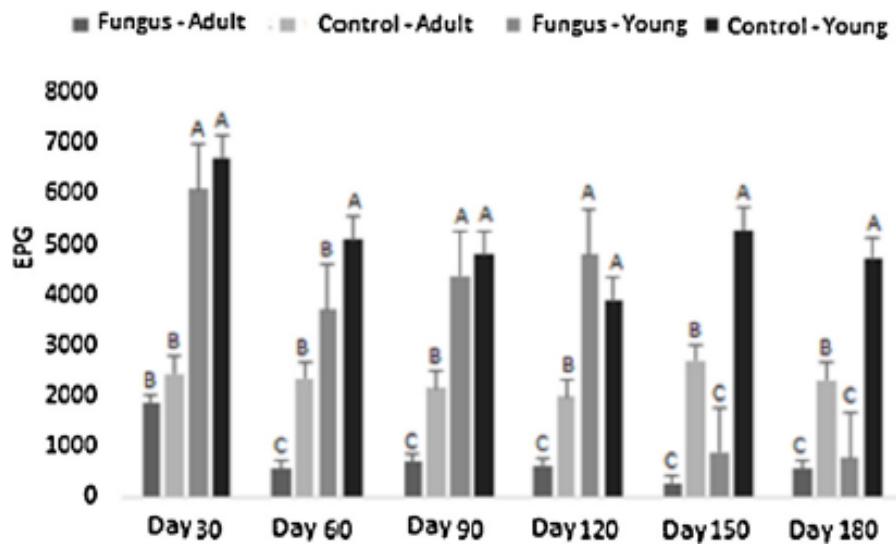


Fig. 1. Means and standard deviations of Eggs Per Gram of feces (EPG) of sheep in the fungus and control groups (adult and young subgroups) during 180 days in the semiarid region of northeastern Brazil. Values with the same letters are statistically similar by Tukey's test ($p < 0.05$).

- A partir dos resultados mostrados na figura 1, qual seria o problema que esses autores tentam resolver? E qual seria a provável hipótese? (0,5 pontos)
- Com base nesses dados, estabeleça um raciocínio lógico e recrie um potencial delineamento metodológico experimental. (0,5 pontos)
- Qual o significado das letras A, B e C? O que podemos concluir a partir dos dados marcados com essas letras nessa figura? (0,5 pontos)
- Os dados de OPG desse trabalho foram comparados usando o teste de Tukey. Quais são as principais aplicações desse teste? Seu uso foi coerente nesse caso? (0,5 pontos)

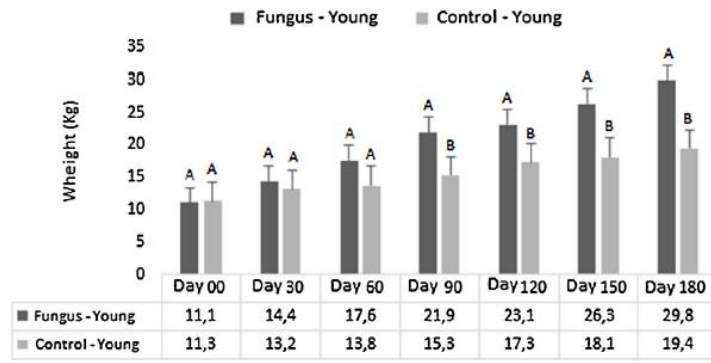


Fig. 2. Means and standard deviations of body weight (kg) of sheep in the young subgroups of the fungus and control groups during 180 days in the semiarid region of northeastern Brazil. Values with the same letters are statistically similar by Tukey's test ($p < 0.05$).

e) A partir dos resultados mostrados na figura 2, o que se pode concluir? (0,5 pontos)